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The Iron Age

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AUGUST 15, 1940

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1855



Improvident Pop

HERE is a little story about a benevolent papa which may have a point of application to present-day affairs.

"Pop" was a free spender and good to his family. He couldn't bear to refuse anything that they asked for. Willie and Jack had to have their own cars, of course, because college life without an automobile was not to be thought of. And the Mrs. and Mabel had to have fur coats that would match those of the neighbors.

All of this kept Pop pretty close to the cushion, for business hadn't been as good as it used to be, but he managed to keep pace with the help of a mortgage and a bank loan.

That is, he managed to keep it up until Willie took sick. Willie, the eldest son and a junior at college, came down with a mysterious disease that the doctors couldn't seem to diagnose. Specialists and nurses were called in and the bills followed after them until Pop's checking account and his savings account were completely blitzkrieged. And the worst part of it was that the doctors said it would take several years of medical and nursing care to bring Willie out of it.

Pop went down to the bank, but the banker said no. And not having a printing press with which to print dollar bills, Pop took the only course that a sane and sensible man could take under the circumstances. He called a family council to consider economies.

None of the members of the family liked the idea of giving up anything that they had, including their standard of living. But neither did they like the idea of losing Willie because of lack of means to supply what he needed. So like good members of a good family should, they agreed to economize so that Pop could put his income where it was so urgently needed.

It was hard at first to go without new fur coats and cars and a cook and maid, but that was forgotten after a while in the happiness of seeing Willie get better and in knowing that the bills were being paid and the family kept out of the poor house.

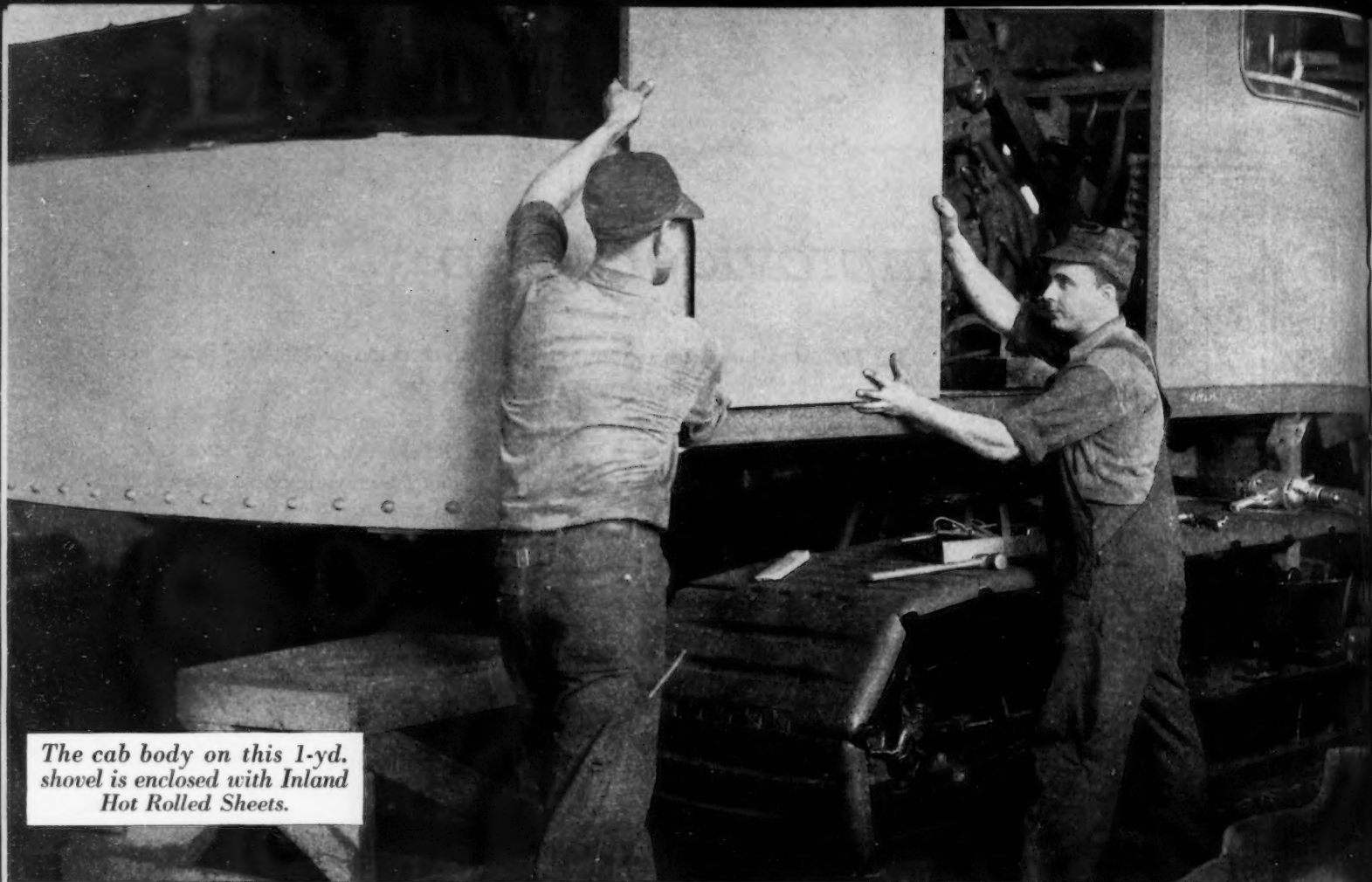
You, gentle reader, may say "So, what?" Wouldn't any self-respecting family head insist on economizing under similar circumstances?"

And I will answer this by asking another question. "When is the Great White Father in Washington going to take similar action to provide the means for pulling his family of Americans through this epidemic of *expeditis*?"

Ten billions a year additional for specialists and nurses to put us in fighting trim, on top of a \$45 billion debt would seem to dictate a little economy.

Strange, isn't it, or is it, that one kind of dictated economy is welcomed in Washington and the other kind given the cold shoulder?

J. W. Van derventy



The cab body on this 1-yd. shovel is enclosed with Inland Hot Rolled Sheets.

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qualities and a smooth, flat surface. They meet every requirement of workability and finish. This change to Inland Hot Rolled Sheets is a good example of co-ordinating engineering design, consumer preference and buying practice.

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The All-Basic Open Hearth

INTEREST is very keen in the possibilities of all-basic open hearths for steel manufacture in the United States. Thus, this article is most timely. Herein, in the first section of this two-part article, the author covers the development of chrome-magnesite brick, describes its use in furnace roofs, and gives detailed data on tests on basic brick for furnace construction.

THE use of silica brick for the construction of basic open hearth furnaces operating at temperatures close to (and even above) the melting point of silica, and containing an atmosphere loaded with iron oxide and lime (see Table I) is probably the greatest compromise in the field of steel works refractories. The fact that silica brick has been able to maintain this position is due in the main to three outstanding properties, viz:

- (1) High refractoriness under load. (Much silica brick can be heated up under 50 lb. per sq. in. to within a few degrees of its melting point.)
- (2) High thermal shock resistance above a critical temperature, viz., about 1112 deg. F.
- (3) Ability to absorb a considerable amount of iron oxide without any serious drop in melting point.

In spite of these advantages, the life of silica brick in open hearth furnaces is very limited. In gas ends and air ends it may only amount to about three weeks, while with fast working furnaces, the life of the roof is often

not more than a few months. Any attempt to raise output by driving the furnace harder tends to result in a serious drop in furnace life. Faced with this obstacle to increased production, it is hardly surprising that numerous attempts have been made to develop a brick which, in addition to being far more refractory, would show adequate resistance to basic dusts. Given such a refractory, output could be considerably increased without the necessity of building new furnaces.

That such an object is not just an idle dream has been amply demonstrated by the results obtained with all-basic furnaces during the last few years. Dozens of such furnaces have been built and many of them have justified the highest hopes of those who installed them. Certain plants, among them those which did much of the pioneer work, have been disappointed, but this is inevitable in a field in which progress often only comes as the result of sad experience.

The greatest obstacle to progress has been the physical limitations of basic refractories. The ordinary magnesite brick is very heavy and therefore requires a much stronger roof suspension. It spalls rather readily and has a comparatively low refractoriness under load. In addition, its conductivity is high. The special chrome-magnesite brick that has made the all-basic furnace a practical proposition (at least for certain purposes) is still very heavy but it has a refractoriness under load approaching that of a silica brick, and in addition a high thermal shock resistance.

It has long been known that the addition of a small amount of magnesia improves the properties of a chrome-magnesite brick and incidentally

By J. H. CHESTERS

Central Research Department, United
Steel Companies, Ltd.,
Sheffield, England

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tally reduces the difficulties of manufacture, in particular the risk of squatting during firing. The special chrome-magnesite brick of today is, however, the result of a great deal of systematic research mainly carried out in this country, the United States, Canada and Austria. The results of this research (much of which has been covered by patents on methods of making fired and unfired chrome-magnesite brick) can be summarized as the development in a basic brick of three very important properties, viz.:

- (1) High thermal shock resistance.
- (2) High refractoriness under load.
- (3) Volume stability at high temperatures.

Without these properties, which can only be obtained by the careful selection of raw materials, accurate grading, and high molding pressures, the chrome-magnesite brick cannot hope to compete with the silica or magnesite brick, even in back and front walls. The high thermal shock resistance of special chrome-magnesite brick depends on careful control of the grading. With fired brick it is generally obtained by keeping the chrome fraction (generally 60 to 75 per cent of the total) in the coarse section and the magnesite (40 to 25 per cent of the total) in the fine section. The high refractoriness under load depends on the conversion of the low melting point gangue material in the chrome ore to forsterite ($2\text{MgO} \cdot \text{SiO}_2$) by reaction with the added magnesia. To insure complete conversion,

the amount of magnesia added is far more than is theoretically required to satisfy the silica present. This is not surprising since only a small proportion of the added magnesia is likely to come in contact with the gangue material. Volume stability is an "automatic" property of chrome-magnesite brick and has been variously attributed to reaction between added magnesia and the gangue, solid solution of magnesia in the chromite, and replacement of the FeO in the chrome by magnesia. In all probability all these factors play a part.

The all-basic furnace was not achieved in one step. It was only after chrome-magnesite brick had proved its usefulness in back walls, front walls, ports, etc., that the plunge was taken and complete furnaces (above the stage level) constructed of basic refractories. Attempts have been made to build open hearth furnace roofs with non-spall magnesite and forsterite brick, but so far the chrome-magnesite brick has given the most encouraging results.

The Roof

Success was first obtained with relatively small furnaces on the Continent, most of which were hard worked and were not shut off at week-ends. The maintenance of these small roofs was a relatively easy matter and the absence of week-end shut-downs doubtless reduced the amount of spalling and thus helped to achieve the remarkable lives obtained. Earlier experiments in this country were less successful and it was not until comparatively recently that really encouraging results were obtained. To the casual observer, the high chrome-magnesite silica price ratio might seem to demand too great an increase in furnace life to justify such trials, but those who have had experience with this type of construction, and particularly those who, having got used to it, have had to return to normal practice, realize that it has many advantages besides long furnace life. Thus the use of chrome-magnesite brick in the back wall and roof results in a marked decrease in the amount of fettling required and also a much lower slag bulk due to the absence of silica drip. There is little doubt that furnaces which are "all basic" except for the roof are also run much harder than the old silica furnaces, and that any return to silica construction not only reduces the steady output per hour, but also greatly increases the amount of shut-down time.

The construction of an open hearth furnace roof with basic brick raises

TABLE I
Analyses of Basic Open Hearth
Furnace Checker Dusts

	Air Checker Dust; Average of Seven Samples	Gas Checker Dust; Average of Six Samples
Fe ₂ O ₃	48.3	39.3
FeO	0.0	0.2
CaO	7.9	13.6
MgO	2.6	4.1
MnO	1.8	1.2
SiO ₂	4.0	17.9
Al ₂ O ₃	3.0	9.9
SO ₃	17.3	6.1
P ₂ O ₅	2.6	1.9
ZnO	2.5	0.8
Alkalies	6.3	1.7
Miscellaneous	3.7	3.3

many problems not experienced with silica roofs. The thermal expansion of silica above 1112 deg. F. is very slight and hence the expansion on a silica roof is much the same on the outside as on the inside. With the chrome-magnesite brick, on the other hand, which has an approximately linear expansion curve, the expansion on the outside is probably about one-fifth of that on the inside. Such a differential expansion cannot be taken up entirely by a lateral displacement. It involves a rotation effect—a much bigger expansion allowance being required on the inside than on the outside. Numerous ingenious attempts have been made to overcome this difficulty, several of them being covered by patent.

Thus, it is suggested that in addition to the usual "floating" skewback channels with adjustable coil springs to take the load, tapered steel plates of corrugated cross section be inserted between the brick; the thick section of the plate being on the inside of the roof. It is suggested that as the roof heats up the corrugations on the inside ends flatten out while the outside of the plate remains rigid; furthermore, that these expansion joints oxidize on the inside and the scale thus formed helps to weld the bricks together.

Another suggestion is the pivoting of the skewbacks in such a way as to permit of rotation in addition to lateral displacement. With a large furnace such an arrangement would require a very complicated and expensive steel work construction above the furnace which might prove very difficult to adjust. Such a method would, however, have the advantage that the roof would be more likely to keep its shape on cooling because the rotation equipment would "go into reverse" and

compensate for the bigger movement on the inside of the roof.

More recently an attempt has been made to give roof stability by suspending alternate courses with steel wires. The springing of the skewback channels is still employed but the strain on them is reduced and the upward tension on the roof tends to minimize spalling that might have occurred due to cracked brick or insufficient compression in the roof. Since the hanger courses are made longer than the others, the life of the roof can be extended by filling the gaps with secondary brick as soon as the roof gets thin. The use of this type of construction requires special tapered roof blocks but in view of the great weight to be carried and the fundamental difference in expansion characteristics of chrome-magnesite and silica brick, such radical changes may well prove to be necessary.

The fact that one medium sized chrome-magnesite roof has now been in service for over 1300 casts, whereas the earlier roofs built with similar brick only lasted about 300 casts, shows the progress that can be made by employing the right technique.

Tests on Bricks

A great deal can be learned from a study of the bricks that have already proved their worth in the roofs of all-basic furnaces. Test data on three bricks that have proved serviceable are summarized in Table II, together with data on one of the inferior bricks recommended for backing purposes.

POROSITY:

It will be seen that although the porosity of these bricks is moderately high their bulk density is at least half as great again as that of silica bricks, which rarely exceed 1.90 gm. per c.c. and which more often only have a bulk density of 1.75 gm. per c.c. It is clear that with a large roof this difference in bulk density will require the use of a far stronger roof construction, quite apart from the springing devices necessitated by the different thermal expansion characteristics of this material.

COLD CRUSHING STRENGTH:

Chrome-magnesite bricks are generally crumbly as compared with magnesite bricks, their cold crushing strength frequently being as low as 1000 lb. per sq. in. This weakness often leads to damage to brick edges during handling and hence to poor joints in the furnace brickwork. A cold crushing strength of at least 2000 lb. per sq. in. is therefore desirable.

PERMEABILITY:

The significance of the permeability to air is still not very clear, but other things being equal, an impervious brick is preferable since it will tend to absorb less iron oxide from the furnace atmosphere than a permeable one. With chrome-magnesite bricks a permeability of 0.1 units is not unusual.

AFTER-EXPANSION:

Most chrome-magnesite bricks (unlike magnesite bricks) show a slight after-expansion on refiring. As previously stated, this expansion has been attributed to a number of causes, but whatever the explanation it is very welcome since it reduces the risk of roof collapse.

REFRACTORINESS UNDER LOAD:

Two principal methods are in use in this country for the determination of refractoriness under load.

(1) A test piece (usually of dimensions approximately $3\frac{1}{2} \times 2 \times 2$ in.) is heated up at about 18 deg. F. per min. under a load of 50 lb. per sq. in. until collapse occurs. The collapse temperature and also the temperature at which the expansion rate of the system is equalized by the rate of collapse of the test piece, are noted.

(2) A similar test piece is heated up to a given temperature, usually 2912 deg. F. under a load of 25 or 28 lb. per sq. in. and maintained at this temperature for a fixed period, usually 1 or 2 hr.

The per cent deformation after this treatment or the prior failure of the test piece is noted. In the first test the better chrome-magnesite bricks give a fail temperature of 3002 deg. F. (1650 deg. C.) or more, while in the second test a collapse of less than 5 per cent after 1 hr. at 2912 deg. F. (25 lb. per sq. in.) is considered adequate for roof brick.

In practice most of the load will be carried by that part of the bricks which is at a much lower temperature than the working face. With those ports which are not water cooled, the use of a brick of high refractoriness under load is essential.

THERMAL SHOCK RESISTANCE:

When test pieces of dimensions $3 \times 2 \times 2$ in. are sawed from special chrome-magnesite bricks that show promise in all-basic furnaces, and exposed to a given series of thermal shocks, they are found to withstand about 30 reversals as compared with only five for most magnesite bricks and 10 for straight chrome bricks.

The test used consists in placing the cold test pieces in a furnace at 1652 deg. F., leaving them there for 10 min. and then placing them on end on a cold brick floor. After 10 min. cooling they are again placed in the furnace and the cycle continued until the test piece can be readily pulled apart in the hands. The factors (in particular grading) which contribute to the production of high thermal shock resistance, have already been discussed in some detail in an earlier paper and will not therefore be repeated here.¹

BURSTING EXPANSION:

Reference will be made later to the ultimate causes of failure of bricks in the all-basic furnace. Suffice it to say here that absorption of iron oxide from the furnace atmosphere leads to a serious expansion which eventually causes the spalling of the bricks. This tendency can be measured by heating mill scale on the surface of the test piece (in the Central Research test 100 gm. of scale are heated on a $3 \times 2 \times 2$ in. test piece for 1 hr. at 2912 deg. F., and determining the sum of the per cent expansions in three directions at right-angles. With some bricks this total expansion may amount to as much as 70 per cent, while with specially "doped" bricks it may be as low as 5 per cent. Works trials show a similar, if not so marked, difference in the behavior of the bricks. The data given in Table II show that the bricks now used have an expansion of about 25 per cent.

MICROSCOPIC EXAMINATION:

Both microscopic and X-ray examination suggests that the better bricks

consist essentially of a 75-25 to 60-40 chrome-magnesite mixture in which the chrome occurs mainly in the coarse fraction and the magnesite mainly in the fine fraction. In addition, there is generally present a considerable amount of forsterite formed by reaction between the gangue material and the magnesia.

OTHER PROPERTIES:

A lot has been written concerning the low conductivity of thermal chrome-magnesite bricks at the working temperature, and of the possible fuel savings from the use of an all-basic furnace. Central Research tests, both in the laboratory and in the works, suggest that the heat losses are very similar to those obtained with silica but markedly lower than those shown by magnesite bricks.

The thermal expansion of chrome-magnesite bricks is of the order of 0.9 per cent (68 deg. to 1832 deg. F.) and in this range is essentially linear. With silica, an equally great expansion is obtained by about 932 deg. F. and this should be borne in mind if chrome-magnesite and silica bricks are bonded together.

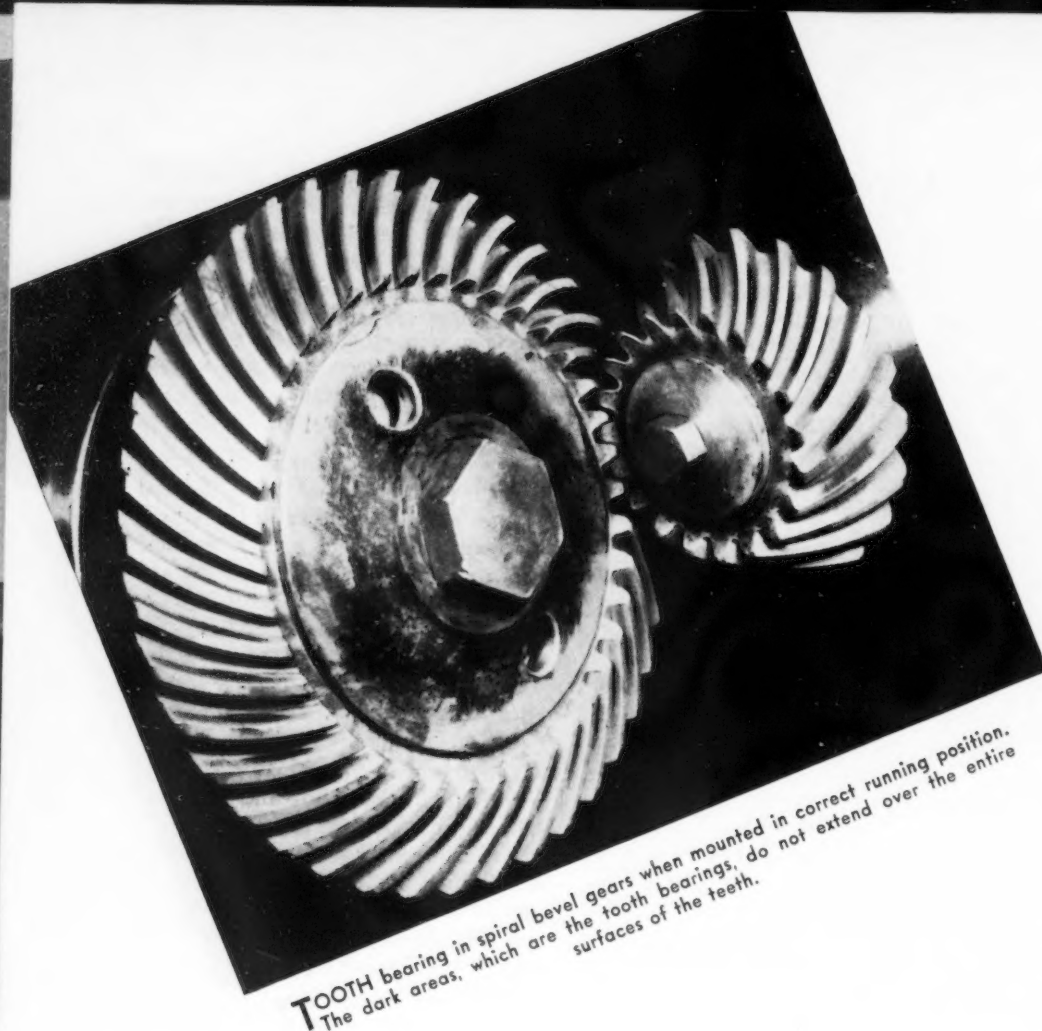
The specific heat of a chrome-magnesite brick is very similar to that of a silica brick and hence it is due to the high bulk density of the chrome-magnesite brick that all-basic furnaces have a much higher heat capacity.

Editor's Note:—Next week the author concludes this timely and informative article with data on backing bricks, furnace life, factors determining furnace life, etc.

TABLE II
Properties of Chrome-Magnesite Brick Used in All-Basic Furnaces

	Brick A	Brick B	Brick C	Brick D (backing)
Porosity, per cent	26.0	21.1	21.2	27.3
Bulk density, gm. per c.c.	2.90	3.13	3.00	2.84
Cold crushing strength, $9 \times 4 \frac{1}{2} \times 3$ in. (brick on end)	2120	3460	3660	1560
Permeability to air, perp. 9×3 in. face (1 skin) ccs. x testpiece height (cm.) per sec. per sq. cm. per 1 cm. water press	0.030	0.045	0.016	0.077
After-expansion, 2 hr., 2732 deg. F.	0.3 per cent	0.3 per cent	0.1 per cent	0.4 per cent
Refractoriness under load:				
(a) 50 lb. per sq. in. Collapse rate = expansion rate	2552 deg. F.	—	2606 deg. F.	—
Fail temperature	3101 deg. F.	—	3002 deg. F.	—
(b) 25 lb. per sq. in. Maintained at 2912 deg. F.	—	40 per cent collapse in hour	—	failed after 9 min.
Thermal shock resistance, No. reversals	30 +	30 +	28 +	27 +
Per cent bursting expansion	26.3	23.6	17.4	35.8
Microscopic examination, approx. cr/mg ratio	75/25	75/25	60/40	75/25
Chrome size (max.)	2 mm.	3 mm.	2 mm.	2 mm.
Magnesite size	Very fine	Very fine	Up to 1 mm.	Up to 1 mm.

¹ Journal American Ceramic Society, 1939, Vol. 22, p. 97.



♦♦♦ Tooth

By ALLAN H. CANDEE
Gleason Works

may be external and internal gears with complementary pitch surfaces and tooth surfaces, as indicated in Fig. 1.

It is apparent in general that any gear generated from generating gear A of Fig. 1 will be conjugate to any other gear generated from generating gear B. Furthermore, any pinion generated from generating gear A for instance, will be conjugate to a gear in the form of gear A itself. This is the case of what are known as formate bevel gears.

Tooth Contact

Surfaces which roll against one another in the manner of gear teeth may contact at only a single point, and at best can contact tangentially at only a line or curve at any one instant. Coinciding surfaces are of course impossible. Two spiral gear teeth, therefore, theoretically touch each other along a curved line of contact as in Fig. 2. As the gears rotate, the line of contact changes position and sweeps over the whole active surface of a tooth.

Tooth Bearing

In practical work it is desirable to have the tooth contact modified slightly, so that it is kept away from the boundaries of the tooth surfaces, thus preventing concentrations of load at the tops or ends of the teeth. Also, this kind of contact is found generally to result in smoother and quieter operation. The portion of the tooth surface which actually has contact when gears are run is known as the tooth bearing. Tooth bearings can be readily observed by painting the teeth lightly with a gear marking compound, and running the gears for a few seconds.

The tooth bearing is one of the most comprehensive and direct dem-

IN all generating processes for finishing the surfaces on the sides of gear teeth, the tool and the generating machine should be thought of as representing an imaginary generating gear which is rolled with the gear or pinion being generated. In bevel gear generation by usual methods, the generating gear is itself a bevel gear and has a conical pitch surface. In some cases, the pitch cone may be flat and the pitch surface a plane, so that the generating gear is then a true 90-degree crown gear. The imaginary generating bevel gear may even be internal.

Tooth Surfaces

For practical reasons, the tooth surfaces of a generating gear are surfaces of a kind which can be obtained by direct mechanical means. Thus, straight bevel gear teeth are generated by tools having straight cutting edges and reciprocated with straight-line motion. The tooth surfaces of the generating gears are then oblique planes. Spiral bevel teeth are generated mostly by the Gleason spiral cutter, which

represents a tooth of the generating gear. Here the tooth surface is in general a surface of revolution, and more specifically a cone, because straight cutting edges are used. For every point in the tooth surface of a generated gear, there is one corresponding point in the tooth surface of the generating gear. By considering variations in the tooth surfaces at corresponding points, we have about the most direct way of understanding the requirements to obtain desired results in gear cutting.

Conjugate Bevel Gears

In earlier times, a bevel gear and pinion were always thought of as both being conjugate to a basic crown gear which could be complementary to itself. The proper tooth surface for a given bevel gear or bevel pinion then was the surface conjugate to or generated by the tooth of the imaginary basic crown gear. When oblique teeth came to be considered, however, with right-hand and left-hand directions, the two basic crown gears were no longer identical, but would still fit together with coinciding tooth surfaces.

In present methods of cutting spiral bevel gears, the generating gears are not exact crown gears, but instead

Bearings in Bevel Gears ♦ ♦ ♦

onstrations of the quality of a pair of gears when set up ready to run. The tooth bearing test gives conclusive information in regard to such features as the following:

- (a) surface smoothness, quality of cutting, grinding, shaving, lapping
- (b) uniformity of teeth, accuracy of spacing, run-out, etc.
- (c) position of contact, pressure angle, spiral angle, correctness of assembly
- (d) amount of contact, curvatures of tooth surfaces
- (e) character of contact, variations at different points of tooth surfaces.

Tooth bearings change when the relative position of gear and pinion is changed. Unsatisfactory tooth bearings may result from inaccuracies of manufacture or of assembly, and also from changes due to heat treatment. In bevel gears it is customary to make allowances for the deflections which

IN the first part of this article, which was abstracted from a paper read at the annual meeting of the American Gear Manufacturers Association at Asheville, N. C., May 22, the author presents some fundamental conceptions of gearing and proceeds to analyze the various factors governing the amount and location of the tooth bearing area of straight and spiral bevel gears. Illustrations in the second and concluding part of the article will show how small displacements from the correct relative position of gear and pinion affect the tooth bearing.

o o o

occur under load. The tooth bearing in bevel gears can be changed by using different tools and different machine settings. Such changes and modifications are almost always made on the pinion, because it has fewer teeth to cut or recut, and because it responds more readily to control measures.

Amount of Tooth Bearing

In considering how desired tooth bearings are to be obtained, it is usually necessary to think only of the pinion, on which changes are to be made. There are two conceptions to

adopt in this work: The first is the difference in the tooth surfaces between a pinion having complete, 100 per cent tooth bearing with the given gear, and a second pinion having the kind of localized tooth bearing desired. A second conception is the difference in the tooth surface between an actual pinion having some kind of a tooth bearing and a pinion having the kind of tooth bearing desired. Thus, we need consider only how to make the slight changes from the surface we *have* to the surface we *want*.

The diagrams in Fig. 3 show how the amount of a tooth bearing is con-

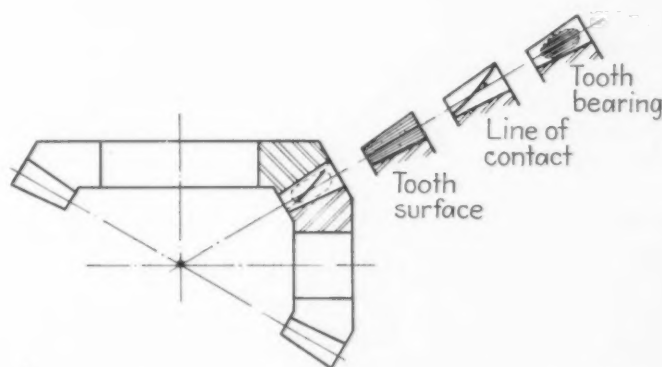
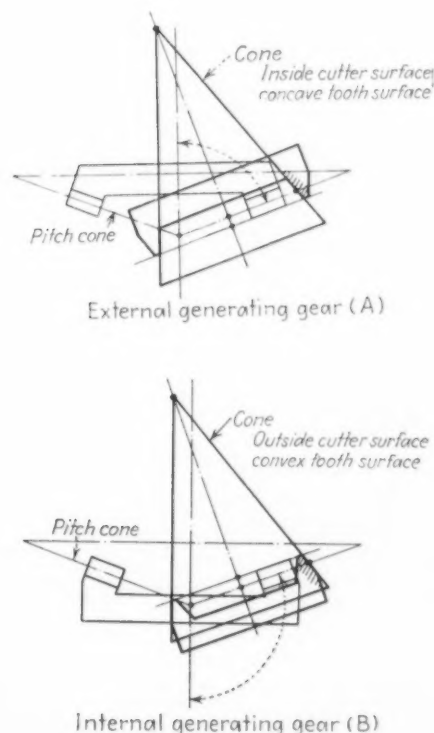


FIG. 2—The theoretical line of contact at any instant is limited by the boundaries of the tooth surfaces, whereas the actual line of contact is limited by the boundaries of the tooth bearing (upper right) which never covers the whole surface of the tooth.

o o e

LEFT

FIG. 1—In generating gear teeth, the tool and generating machine may be thought of as representing an imaginary generating gear which is rolled with the gear being cut. In making spiral bevel gears by present methods, the imaginary generating gears may be external or internal gears with complementary surfaces. The pitch surfaces are respectively external and internal cones of supplementary angles. The tooth surfaces are also cones, concave and convex, represented by inside and outside edges of the cutters.

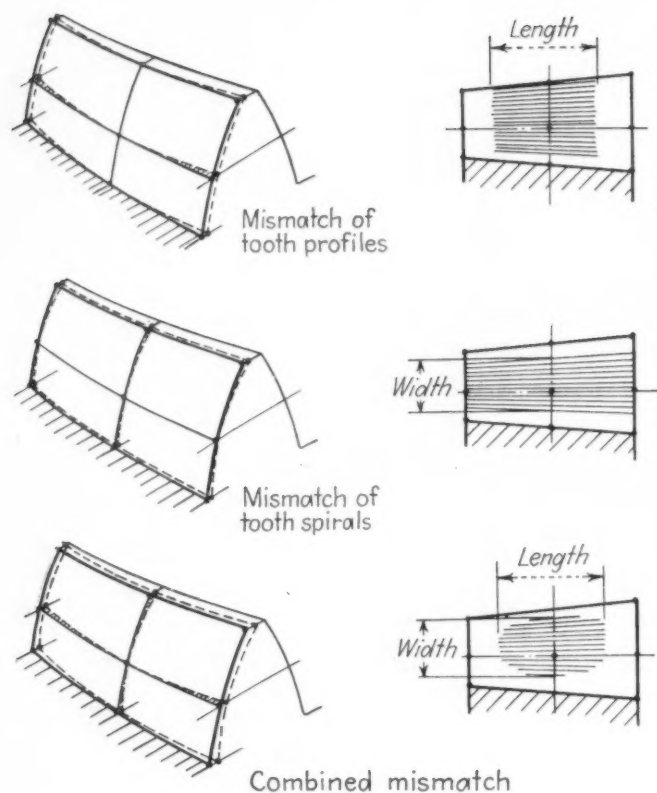


FIG. 3—The length of tooth bearing in the direction from end to end of the tooth is affected by the difference in curvature or mismatch of the tooth spirals (upper). Width is affected by difference in curvature of the tooth profiles (middle). In actual gears, the tooth bearings are modified in both directions (lower).

trolled by differences between surface curvatures so as to produce less than theoretical contact.

Position of Tooth Bearing

The diagrams in Fig. 4 show that modifications of pressure angle and spiral angle result in changes in the position of tooth bearings. A gear and pinion necessarily have the same pressure angle and spiral angle at the point in the tooth surfaces where they are in contact. Thus a tooth bearing at the middle of the tooth surface is proof positive that the pressure angle and spiral angle match for the position in which the tooth bearing was obtained.

A difference or change in pressure angle will shift the tooth bearing either up or down on the tooth profiles. A difference in spiral angle will shift the tooth bearing towards one end or the other.

Direction and Shape of Tooth Bearing

Tooth bearings are not always "square" with the principal directions of the tooth surfaces and are not always of regular outline. A condition encountered in generating spiral bevel gear teeth is a tooth bearing low at one end and high at the other. This has received the name bias tooth bearing. See Fig. 5. The kind of surface mismatch which results in bias is illustrated by two tooth surfaces tangent to each other along an oblique line of

contact, on each side of which the profiles curve away slightly from one another.

The relative position in which a bevel pinion and gear actually run is subject to various tolerances, deflections, and displacements. There are manufacturing tolerances not only for the gears themselves, but also for the shafts, bearings, and housings. Some

deflection always occurs under load. Heat treatment causes distortions of tooth surfaces and changes gear dimensions. It is therefore important to know the effect on tooth bearing of various relative displacements between two gears which run together.

In the simplest case of straight bevel gears with completely conjugate teeth of a form corresponding to involute spur gears, a small variation in shaft angle in the bevel gears would correspond to a variation in center distance in spur gears and would not affect the tooth bearing to any noticeable extent. Any other relative displacement between the bevel gear and pinion, however, will affect the tooth bearing in a manner corresponding to either a change in spiral angle or in pressure angle, or both.

Vertical Displacement in Spiral Teeth

In Fig. 6, for instance, diagram (a) indicates the condition when a straight tooth pinion is displaced downward as shown. Diagram (b) shows that when the gear is then rotated so as to restore contact with the pinion, the tooth surfaces illustrated will touch only at their outer ends. The amount of downward displacement shown is enormously exaggerated, but the relative effect will be as illustrated, no matter how small the displacement may actually be.

Spiral bevel teeth can be much less sensitive than straight teeth to such relative displacements. Diagrams (a) and (b) in Fig. 7 show the general

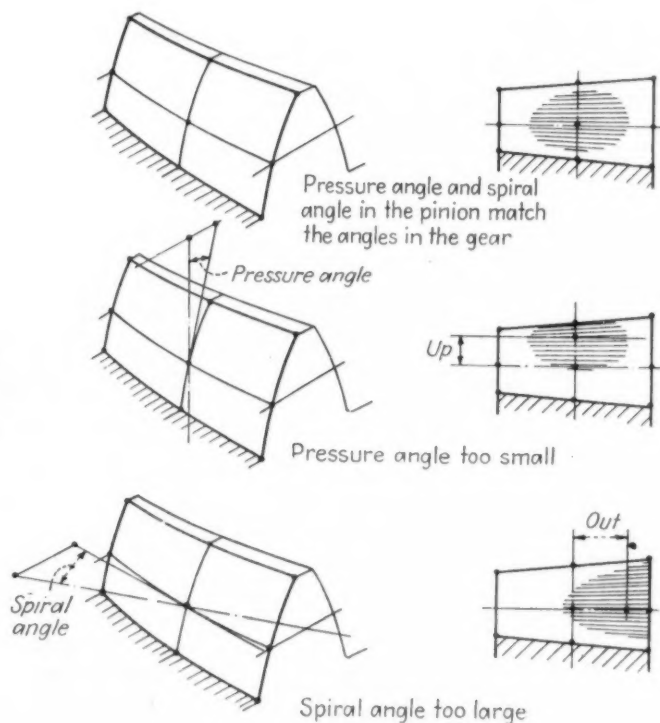


FIG. 4—The position of tooth bearing in spiral bevel gears is affected by changes in pressure angle or spiral angle.

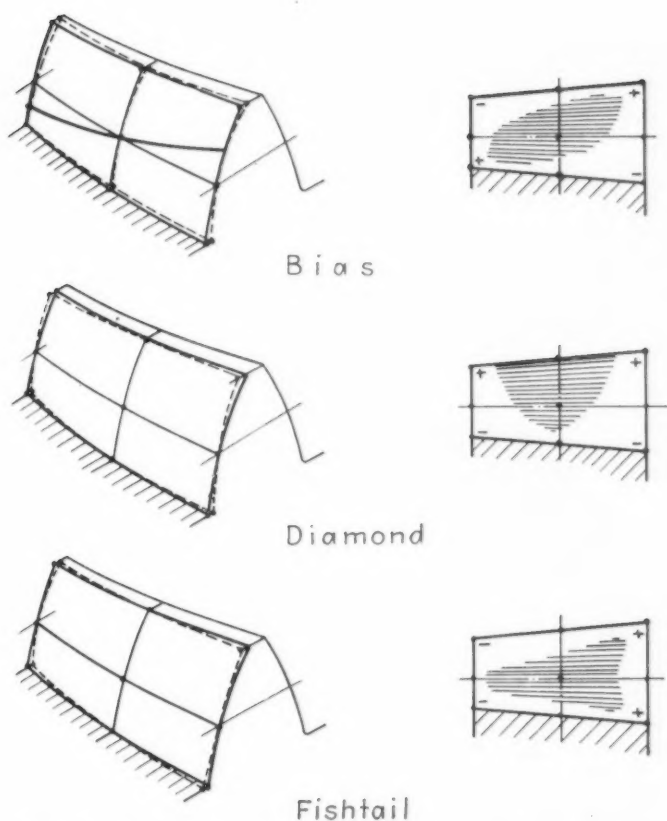


FIG. 5—The kind of surface mismatch that results in a bias tooth bearing in mating spiral bevel gears can be corrected in pinion generation by changes in machine settings that can be directly calculated. Less common are diamond and fishtail tooth bearings, which can be corrected by trial and error.

effect in spiral teeth of a downward displacement of the pinion. Instead of the tooth bearing being shifted to the extreme ends of the teeth, it is shifted outward only part way from the center.

Horizontal Displacement

This difference in action is due principally to the fact that the teeth have somewhat different amounts of curvature, although the general position of the center of curvature is also an important factor. It has always been customary to cut spiral teeth with the concave surfaces of greater radius than the convex surfaces, that is with radial mismatch. Some of this mismatch occurs naturally from the radial differences between outside and inside cutting edges of the cutter blades, and any desired amount of mismatch can be had by adjusting cutter diameters. The relation between mismatch of surface curvatures and displacement of tooth bearings is a three dimensional problem and requires consideration of pressure angle and profile shape in a complete analysis.

Probably from the beginning of

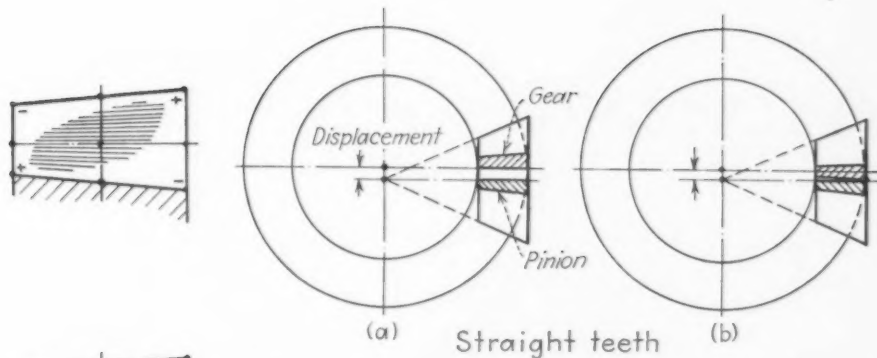


FIG. 6—In straight bevel gears, when the pinion is displaced vertically in relation to the gear, the teeth will touch only at their ends and oppositely on the two sides.

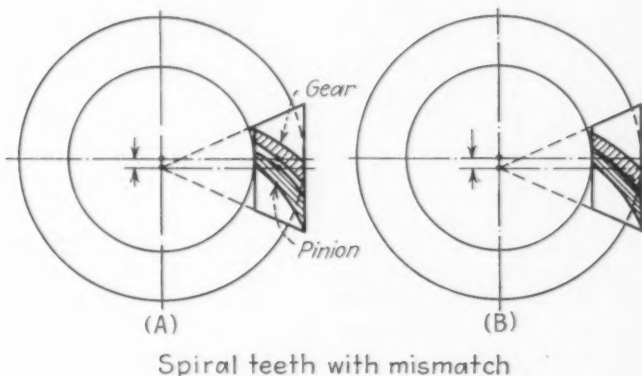
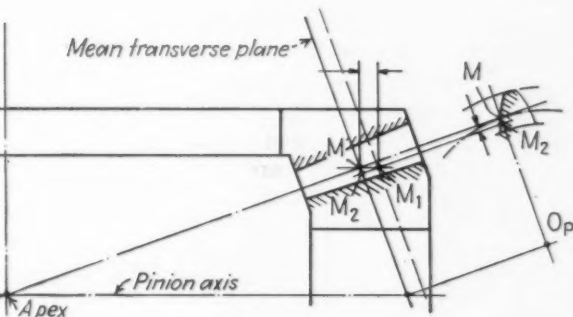


FIG. 7—Spiral bevel teeth are much less sensitive to displacement of the pinion vertically. Tooth bearing is shifted only part way to the ends of teeth because of different tooth curvatures.

FIG. 8—Displacement of the pinion along its axis principally causes a slight change in pressure angle.

Point M is a mean point in the tooth surfaces. If the pinion is displaced horizontally to the left, some point M_1 of the pinion will be brought into contact with point M of the gear. Point M_1 , however, has the same pressure angle as point M_2 below point M in the pinion, that is, a smaller pressure angle. The horizontal displacement of the pinion from M_1 to M, therefore, has the effect of decreasing the pressure angle of the pinion with respect to that of the gear, and produces a shift of the tooth bearing upward on the pinion profile.



Compare with Fig. 4 (middle).

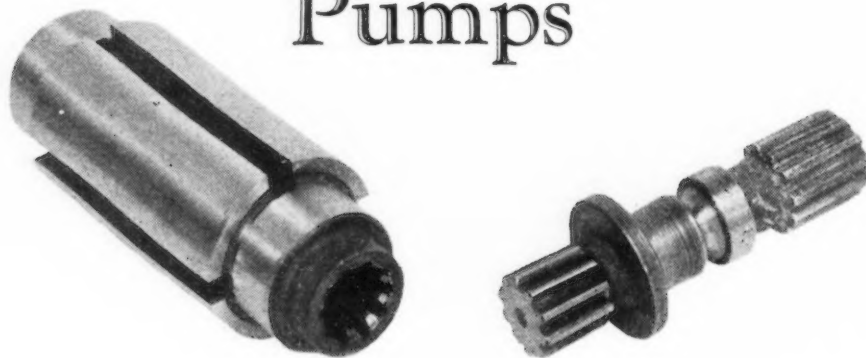
bevel-gear cutting, a displacement of a pinion along its axis has been used to cause slight changes of pressure angle. This may be referred to as a horizontal displacement, because of the positions in the testing machines as customarily built. The principal effect of a relative horizontal displacement of gear and pinion is of the kind illustrated in Fig. 4 for change of pressure angle. A diagram to show the geometry of this change is given in Fig. 8.

These changes are not of a "pure" nature. In bevel gears of higher

ratios, the horizontal relative displacement affects principally the pressure angle, but also has an effect on spiral angle, although this is proportionally much smaller. The vertical relative displacement affects principally the spiral angle but also has a slight effect on pressure angle. In miter gears and in gears of only low ratio, the amount of the effect of a horizontal displacement in the direction of one axis, is about the same as in the direction of the other axis.

(TO BE CONCLUDED)

Accuracy Features Aircraft Fuel Pumps



NEW type aircraft fuel pump rotor and drive coupling, made by Pump Engineering Service Corp., Cleveland.

A STRONG trend toward gear tooth spline drives for aircraft fuel pumps and other accessories driven off the motor is a good example of how commercial aircraft requirements have assisted military aviation.

With air liners stepping up their operating time, some doing as high as 300 hr. per month in the air, service requirements of parts have become stricter, and are now accruing to the benefit of the military.

Pump Engineering Service Corp., Cleveland, is one producer prominent in the change from square and tongue drives during the past two years. This concern produces fuel pumps, hydraulic pumps, air pumps for flight instruments and air pumps for deicer overshoes, all requiring a high degree of accuracy.

In milling a slot for its drives the company first tried to complete the mill in one cut, but then found that two cuts at least would be necessary for accuracy, and even then the job lacked desirable aspects.

The production setup was altered to provide a roughing cut followed by hardening of the part and a finish grind. The result was a satisfactory job, but still with the tongue driving on two corners rapid wear resulted.

In studying the spline drive, which offers more points of contact, Pump Engineering Service Corp. at first believed costs would be greatly increased and production problems multiplied. Upon actual adoption, however, the spline drive required less effort to hold the parts accurate and percentage rejections were lessened.

Use of a floating universal block to take up misalignment was unnecessary. The shaft simply floats.

A Fellows gear shaper generates the male spline. Broaching the female part involves an important design job to enable pulling of the broach clear through the piece. The chordal thickness of the spline tooth is held to ± 0.001 in. in many cases.

As an example of the accuracy required for aircraft accessories, the rotor shaft journal diameter of 0.6867 in. is held to $+0.000 - 0.0003$. Comparable tolerances are held on the mating bearings.

The company broaches fuel pump slots, too, as well as the splines. Formerly the slots were finished by hand filing. The broaching of the slots is done on a Model 2-L Lapointe.

Nitralloy steel is used for nearly all hardened parts due to the low distortion encountered in heat treatment.

On gears, after grinding the blanks and cutting the teeth, the part is burnished, nitrided, and then the journals and faces are ground. Lapping of the gear tooth contour is the next operation.

In spite of the fact that aircraft precision and quantities will not permit the use of automotive production methods, the company has adopted straight line factory routing to a high

degree in the last two years, and has installed much new equipment. This has enabled them to keep pace with the rapidly increasing demand for aircraft accessories. All pump rotors are magnafluxed. The completed pumps are put through extensive tests and a record is kept of the acceptance test data on each article shipped.

Pump covers of die cast aluminum alloy are being used experimentally by the company. Several unexpected difficulties have been encountered here, but it is believed that the selection of the proper material, together with the use of extremely high pressures during the die casting process, will give satisfactory results.

In addition, to the complete line of pumps manufactured by the company, it also specializes in hydraulic equipment for aircraft. This includes actuating cylinders for operating landing gear and flap gear, hydraulic accumulators, and various types of high pressure hydraulic valves. It is of interest to note that the aircraft industry in general has recently turned to hydraulic control, as this dependable source of power offers considerable savings in weight over that encountered with electric power, according to aircraft designers of the major airplane companies.

Some of the new products recently developed by the company are a 15-in. diameter screwed type spherical accumulator, a hydraulic flow divider which assures uniform flow to two actuating cylinders, and a hydraulic flow control valve which limits the maximum rate of flow without causing any pressure loss at low flow rates.

How to Rate Employees

By EUGENE CALDWELL

Consulting Management Engineer,
Milwaukee

RECENT developments in personnel administration have emphasized the necessity of some method of weighing the various human factors of employees and of determining more accurately than by mere impressions just how valuable each employee is in his particular work. This article presents very useful data on this important subject.

ment's decision, definite proof of the factors on which the decision was based will be available.

Regardless of whatever else may be charged against the movement toward collective bargaining, the efforts definitely to rate employees is one good that has come out of it. In organized baseball every act of an individual is recorded, and the management knows exactly by mathematical percentages the value each player is to the team. It is very essential in industry that accurate gages be developed to determine each individual's worth to the business.

Not only is there need to get away from general impressions of workers in collective bargaining procedures but management should have accurate gages of employees for many other purposes. The following tabulates the necessity of employee rating from various standpoints:

(1) To justify actions which may later be challenged before the national or state labor board.

(2) To explain and justify actions with a local union or plant grievance committee.

(3) To supply accurate information for personnel control on the part of management.

(4) In justice to the employees themselves.

The uses to be made of employee ratings in addition to those which are obvious from the tabulation above might be listed as follows:

(1) For wage and salary administration.

(2) To determine persons eligible for promotion.

(3) To determine individuals to be retained in case of layoffs.

(4) To establish factors provided in many seniority clauses.

(5) To determine if all men are placed to the best advantage in the respective jobs available.

(6) To eliminate favoritism on the part of the supervisory force and assist in impartiality in dealing with the men.

(7) To create a better attitude on the part of the workmen, pointing out his weaknesses and giving him something to work toward.

In starting out with employee rating a sharp distinction should be made between *employee rating* and *job rating*. They both work together but are two separate and distinct management tools.

Job rating attempts to rate the various jobs in an establishment independent of the man who is occupying the job. By this means rates can be set on each job depending upon its worth to the company and without considering personalities. A rate band can be set for each job above or below the ideal rate, and from this point on the employee rating should govern the wage rates. If the rating of the employee occupying the job is low, then the employee should be within the hourly rate band for the job but at

RATING of employees, sometimes known as merit rating, has become very popular of late, although it is not a new idea. For many years various attempts have been made to classify the different human factors and reduce them to mathematical terms so one man could be placed above another in his proper relation of value to the company.

This management tool has assumed greater importance in recent years because of changes in labor relations. Previously a man could be promoted or fired when it pleased the boss, who depended largely on impressions of the individual.

Now that collective bargaining is the order of the day, a concern must have more tangible evidence than general impressions. Everything must be set down on paper so if anything comes up to challenge the manage-

the lowest point in that band. As the employee ratings show the man has increased in abilities, his hourly rate should be increased until he is at the top of the band. Remaining at the top of the hourly rate band for any length of time would indicate that he should be promoted to the next higher job in the job rating as soon as a vacancy occurs.

Almost everyone responsible for personnel in an industry has at one time or another attempted to set up some scheme for judging the human qualities of the workmen. The various factors making up individual personalities are very intangible and their worth in a given job is very controversial. Practically every quality of personality has some small bearing on an individual's worth to a company. When an attempt is made to pick out certain factors and particularly to evaluate one factor against another, the investigator enters the field of pure opinion regarding which each person has a different belief and upon which each passes different judgment.

Rating Systems Analyzed

To list every attribute upon which judgment of an individual's worth to a company could be passed would be to tabulate all of the adjectives in the dictionary applied to human personality or behavior. The writer has made an extended analysis of 24 different rating systems in use in as many different companies. This analysis indicates that 95 separate factors have been determined as being important enough for recording each employee's position with respect to it.

There follows a tabulation of the different factors used in the 24 rating plans analyzed. The factors appear in the order of their popularity except that closely related items are grouped together.

Counted together as one item are only those factors which appear to the writer to be exactly synonymous. Any adjective having even a slightly different meaning is listed as a separate item but related to it and immediately following it in the list. The figures after each item indicate the number of rating plans in which the particular item appeared.

Attitude, team work, cooperativeness . . .	20
Deportment, obedience, conduct	5
Disposition	2
Manner	1
Dependability, reliability, accepts responsibility	18
Physical condition, health	15
Age	2

Quantity of work	14
Industry, effort, energy, steady worker, use of working time	14
Speed, promptness	8
Initiative	14
Supervision required	5
Judgment, able to make decisions	4
Adaptability, versatility, adjustment to job	14
Safety	10
Skill, ability	7
Intelligence, intellect, thinking, mental, common sense	6
Service	7
Citizenship	4
Dependents	3
Residence	3
Home owner	2
Marital status	2
Head of family	1
Appearance	6
Job knowledge	5
Knowledge	5
Knowledge of company policies	1
Knowledge of sales plans	1
Knowledge of advertising	1
Technical	1
Speech	5
Voice	2
Ability to learn, ease of learning, use of suggestions	5
Character, integrity	5
Ready to fight, control of emotions, self mastery	4
Nerves, impulsive	4
Completing assignments, follow through habit, perseverance, patience	4
Effectiveness	1
Original contributions, suggestions, ingenious	4
Adequate reports, clear expression, correspondence	4
Education	4
Neatness of work, order, clean	4
Leadership	4
Late, punctuality	3
Quits ahead of time	2
Attendance	2
Drinking	3
Habits	2
Planning, systematic, methodical	3
Vision	1
Resourceful	3
Debts, financial, thrift	3
Teaching ability	3
Enthusiasm	3
Interest	3
Self-confidence, self reliant, courage	3
Social	2
Sympathetic	1
Friendly	1
Timid	1
Cheerful	1
Conceit	1
Courtesy	1
Prejudice	1
Analytical ability	2
Logical	1
Future development, potential value	2
Personality	2
Tact	2
Memory	2
Able to follow oral directions	2

Alert	2
Energy, endurance, vitality	2
Profit by criticism	1
Sensitive	1
Training	1
Imagination	1
Stock subscriber	1
Able to follow written directions	1
Intuitive	1
Will power	1
Loyalty	1
Self-analysis	1
Maturity	1
Sense of humor	1
Wasteful	1
Practical	1
Ambitious	1
Concentration	1
Sales ability	1
Observing	1

This analysis shows that a determination of the employee's attitude was deemed essential by practically all of the rating plans. His dependability was next in importance followed by physical condition, and quality and quantity of work produced.

The rating systems analyzed might be segregated into two classes as follows:

(1) Those that record facts concerning an employee and impressions of his personality.

(2) Those that attempt to grade an employee's worth in his job and to apply mathematical ratings to this worth.

The systems of the first class in use are generally quite lengthy and involved. Some have listed many adjectives describing personality as a sort of check list with the thought of suggesting phrases which would describe an individual. Unfortunately, most of these have not been worked out in a very logical manner, there being considerable duplication not only by the use of phrases having identical meanings but in a few instances by repeating the same word again in another place in the rating form. Also several rating systems were unique in listing mostly negative personality qualities, perhaps with the thought that negative characteristics could be spotted more easily than positive ones.

Rating systems of the first type may be of some value in recording facts and personality impressions for a new applicant or for a new employee shortly after he comes with the company. Few of these facts or impressions change except over a long period of time, and hence there is little use in making periodic ratings of this type. Moreover they do not lend themselves to comparison of one employee with another. No general impression can be gained of an individual's worth to the

NEITZEL MANUFACTURING CO., Milwaukee, Wis.						CLOCK NUMBER _____	
EMPLOYEE RATING							
NAME _____				DATE _____ 19____			
DEPARTMENT _____				RATED BY _____			
OCCUPATION _____				CHECKED BY _____			

DEGREE	1	2	3	4	5	6	7	8
ATTITUDE OPENMINDEDNESS. DEPORTMENT. CONDUCT. DISPOSITION. TEAMWORK. WILLINGNESS TO COOPERATE IN CARRYING OUT COMPANY POLICIES. OPINION TOWARD COMPANY IN GENERAL.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DEPENDABILITY YOUR CONFIDENCE THAT EMPLOYEE WILL CARRY OUT INSTRUCTIONS. ACCEPTS RESPONSIBILITY. RELIABLE FOR TICKLISH JOBS.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
QUALITY ACCURACY IN WORK. WORKMANSHIP. MEETING ESTABLISHED STANDARDS. FREEDOM FROM ERRORS.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INDUSTRY EFFORT AND ENERGY PUT FORTH. USE OF WORKING TIME. STEADINESS OF WORK. SPEED AND PROMPTNESS. FOR WORKERS NOT ON INCENTIVE, RECORD THE OUTPUT OF SATISFACTORY WORK.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ADAPTABILITY VERSATILITY. ADJUSTMENT TO JOB OR CHANGED CONDITIONS. EASE WITH WHICH NEW DUTIES ARE LEARNED.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
KNOWLEDGE KNOWLEDGE OF JOB. GENERAL KNOWLEDGE OF BENEFIT TO COMPANY. KNOWLEDGE OF COMPANY POLICIES, PRODUCTS, AND OTHER DEPARTMENTS. TECHNICAL ABILITY.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DO NOT WRITE BELOW THIS LINE		
POINT SCORE ATTITUDE _____ DEPENDABILITY _____ QUALITY _____ INDUSTRY _____ ADAPTABILITY _____ KNOWLEDGE _____ TOTAL _____	DEDUCTIONS ACCOUNT OF DATA FROM OTHER RECORDS SAFETY RECORD _____ POINTS ATTENDANCE AT NIGHT SCHOOL _____ POINTS LATE OR ABSENT FREQUENTLY _____ POINTS HEALTH _____ POINTS FINANCIAL _____ POINTS PIECE WORK (ADJUST "INDUSTRY" RATING PLUS OR MINUS) _____ POINTS NET DEDUCTIONS _____ POINTS FINAL SCORE _____ POINTS CLASS _____ GROUP _____ NUMERICAL STANDING _____	

FORM PR-6 RECORD ANY COMMENTS ON THE BACK

THIS rating form has eight degrees for each of the items. Since they progress from left to right, a pretty clear general impression of the worth of an employee can be gained by observing how far to the right most of the check marks are.

company when such ratings for a number of individuals are at hand.

Certain Criticisms

Rating systems in use of the second type might be criticized from the standpoint that some factors are included in the rating to be made by the foreman or supervisor where there is a better source of information for that particular point, for example, the actual records of the hospital or first aid room are better evidence of an employee's safety habits than the opinion of the foreman. The same is true of health and physical condition, which can best be determined by physical examination. Also when employees are on incentive rates the actual production or payroll records are better evidence than the foreman's opinion as to the quantity of work done. Such items as attendance, lateness, or quitting ahead of time can better be determined from time clock records than by an impression of the foreman. Such facts as length of service, citizenship, dependents, residence, home owner, marital status, head of the family, etc., are important records to have in connection with the personnel records of an individual, but they should not be made part of the material which must be recorded by the rater. If it is desired to give some numerical value to any of these items, they can enter in figuring up the employee's standing without appearing on the rating form.

A good rating plan of the second type must be simple and involve only a few of the more important items. If the rating is made too complicated, the foreman will not do a good job partly because he will become confused and partly because the job will be so laborious he will not give each item the attention it deserves. Moreover even though just a few items are included, the effect of most of the other personality characteristics will unconsciously be brought into the rating of the factors given, and a pretty clear impression will be gained of an employee's worth in his job.

Each of the factors used should have a number of degrees well worked out and clearly described. For example the suggested rating form on the preceding page has eight degrees for each of the items. Since they progress from left to right, a pretty clear impression of the worth of an employee can be gained by picking up his rating sheet and observing how far to the right most of the check marks are.

If the employees are to be placed in certain levels mathematically, it is

necessary to apply numerical values to each grade or degree of each factor. Here is where the biggest item of controversy comes in. No one can say for certain that attitude should be given greater weight than the other items. The main thing is to be consistent. It really doesn't matter a great deal what values are given to the various factors since the ratings are relative only.

The following tabulation is a suggested table of values to be used with the sample form shown:

Grade	1	2	3	4	5	6	7	8
I. Attitude	25	22	20	18	15	12	10	7
II. Dependability	20	18	16	14	12	10	8	6
III. Quality	20	18	16	14	12	10	8	6
IV. Industry	15	14	12	10	9	8	6	5
V. Adaptability	10	9	8	7	6	5	4	3
VI. Knowledge	10	9	8	7	6	5	4	3
	100	90	80	70	60	50	40	30

It is important that the foreman have no knowledge as to the point values of the various factors. He should make his ratings without being influenced by the weight given the different items.

The National Metal Trades Association, which has done considerable work in this connection, has developed an ingenious cardboard mat with holes matching with the squares on the rating sheet. Under each hole the numerical value to be given each item is shown. When this mat is placed over the rating sheet, the sum of the values for all the holes through which "x's" appear is the employee's rating.

It is suggested that certain other factors should be taken into consideration to make up the final rating. These factors are ones where there are better data available than the opinion of the foreman. After getting the final score from the foreman's rating sheet these additional negative factors should be applied as a subtraction from the total score if the worker is under average in regard to them.

The factors of this type together with the suggested deductions are as follows:

Factor	Deduct if Below Normal
Safety record	— 5 Per Cent
Night school attendance	— 5 Per Cent
Late or absent frequently	— 2 Per Cent
Health causing frequent absences	— 2 Per Cent
Financial trouble causing garnishee, etc.	— 1 Per Cent

In making these ratings it is suggested that the foreman go through the entire lot of his men on a single factor before going to the next factor. For example every man should be rated on "Attitude" before going to

"Dependability." It would be better, too, to select the employee who had the best attitude in the entire group and the employee who had the worst attitude. Then the others should be fitted in between comparing them with the two individuals at the top and bottom of the list.

Foremen should not keep a copy of the ratings given, for upon rerating the second time the previous ratings should not be on hand to influence the rater. The entire organization should

be rated in this manner at least once a year and preferably every six months.

Disregard General Impressions

Raters should try to disregard general impressions of an employee when rating him and also any personal friendships, likes, dislikes, or personal feeling. Moreover he should try to think of typical instances of his work and not the unusual case. In addition a foreman should avoid giving high ratings to the men he has trained and low ratings to the others.

In comparing the ratings given the men in two different departments by their respective foremen care should be taken that they are on the same basis. One foreman may be particularly lenient and rate all of his men high with the idea that he doesn't want to give anyone a black eye. Another foreman may be particularly hard on his men in rating and rate them all low. Rating a man lower than he deserves is of course unfair to the man himself, whereas rating him too high is unfair to the others.

The National Metal Trades Association suggests that ratings should be checked after being made, and if they do not fall approximately within the following groups, the ratings are probably not on a correct basis:

Percentage of Total Employees	Employee Rating Values
2 to 5	91 to 100
7 to 15	81 to 90
60 to 75	71 to 80
8 to 16	61 to 70
2 to 5	60 or below

This is in line with the percentages

that psychologists give us as to the distribution of intelligence in any representative group. In other words 60 to 75 per cent are average, 2 to 5 per cent are geniuses and the same amount are generally sub-normal.

An employee's ratings should not be disclosed to others but should be kept confidential. But there is considerable controversy over whether the ratings should be shown to the employee in question or not. One group claims that this will cause the employee to correct his weaknesses and will create a better attitude since the employee will realize he gets credit for any effort put forth. Others insist that the foreman will not give a true rating of the employee if he knows the

employee will see it. Consequently all ratings will be excellent with nothing against anyone.

With job rating there are advantages to be gained by having the work done by some outside organization, particularly if the same organization makes job ratings in other plants where wage rate comparisons can be made. But with employee rating the job must be done in your own organization. No outsider is able to pass an intelligent opinion on the characteristics of your workers.

Moreover, there is not the advantage to be gained with uniformity of rating throughout other plants in the district. It is highly advantageous to determine

if hourly rates for various jobs are in line with the district, but nothing can be gained by trying to carry it further and compare rates for employees according to their score under the employee rating system. Consequently, if the rating is uniform within a single plant, that is all that can be asked for.

In using employee rating systems it is necessary to be careful not to become over enthusiastic and place more emphasis on it than it deserves. It is simply an attempt in the right direction. No system can be proved mathematically correct. The results are only relative within a single plant, but when the ratings are consistent for the entire shop, fair comparisons between individual workers can be made.

Gear Case Machining Modernized

A LARGE automobile manufacturer recently modernized his machining setup on malleable iron differential gear cases. Quality of the work was improved, production boosted 75 per cent, and machining cost cut by 82 per cent.

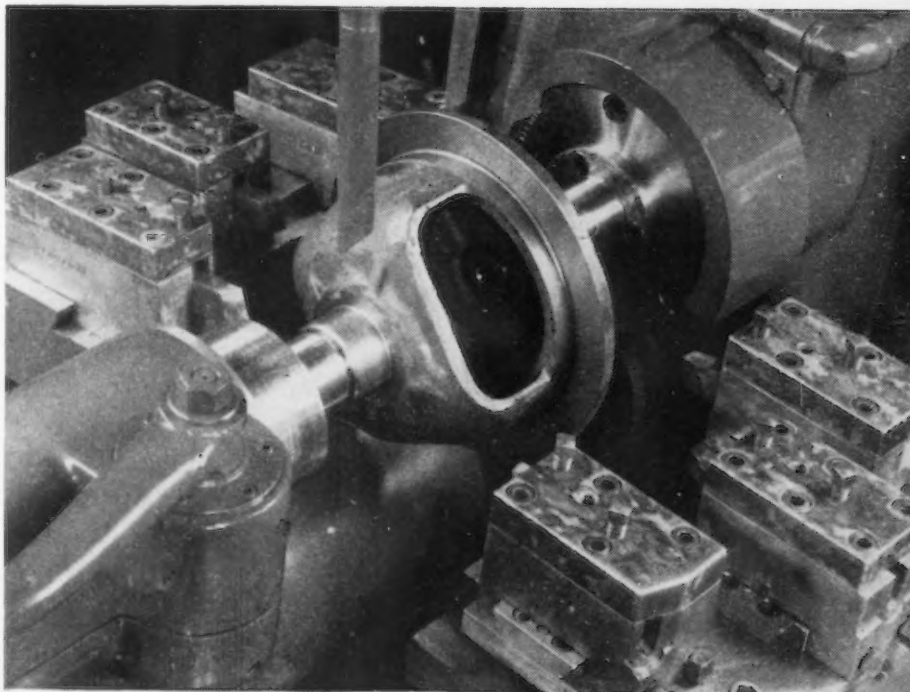
The differential gear cases (see photo) had to be finish turned and faced to meet close tolerances as to eccentricity in a volume substantially larger than was possible with the shop equipment available. Using existing equipment it was necessary to face, turn and bore on two different lathes, followed by semi-finishing operations on an old style automatic lathe and the use of two more different machines for grinding. Three handling operations were thus necessary, and five different machines and operators were required. To machine each differential case by these means cost 29c., the production being 30 an hr.

By rough turning on the older automatic lathe, centering on a drill press, and finishing on a new Gisholt No. 12 hydraulic automatic lathe, machining time was reduced by 43 per cent and machining cost dropped from 29c. to 5c. each. Parts finished on the new lathe did not require grinding and the eccentricity tolerances were met. An indicator reading of 0.002 in. was allowed for eccentricity on the drive gear seat but actual test showed readings not to exceed 0.0004 in.

All machining operations in the new machine are done with one chucking. (See photo.) Both hubs of the gear

case are finish turned to a tolerance of 0.001 in. and the ring diameter to 0.0015 in. The front slide of the automatic lathe holds three tool blocks which are used for this operation. At the same time, three tools on the rear slide finish face and chamfer the ring gear seat and finish form and face both hubs to length.

Cemented carbide cutting tools are used, the front tool feeding 0.004 in. per revolution and the rear tool 0.003 in. per revolution. Speed is 205 r.p.m.





EIGHTEENTH in a Series of Articles on the
Technical and Economic Aspects of Metal
Cleaning and Finishing

DISCUSSION has been rife, ever since the first molded plastic article was produced, to determine the relative merits of metals and plastics. For a long time parts were made of either one or the other. Designers then found ways to combine the two to take advantage of the best features of each, a common, present-day example being the manufacture of molded plastic articles having integral metal insets. Now, too, plastic housings are being molded around intricate metal assemblies. An allied application is the recent advent of plastic surface coatings for sheet metal products.

Nitrocellulose was the first modern plastic to be used in the surface-coating field. The advent of pyroxylin coatings constituted a major revolution in the paint and varnish field. When applied to automobile bodies, they shortened the finishing time so drastically that the whole industry took notice. After such a remarkable beginning, no time was lost in the development of other finishes utilizing synthetic plastics in surface coatings. Many of these combine better durability at lower cost, with the speed and ease of application of lacquers. These newer resins are of two gen-

eral types. One type undergoes chemical reaction during baking, forming a hard, durable, and resistant finish. A second type hardens by evaporation of solvent analogous to the pyroxylin lacquers and depends only on the bake to free the film from solvents and fuse the resin into a continuous, adherent coating. The properties which result—flexibility, hardness, and inertness—are dependent on the chemical nature of the resin and do not change with baking. The polyvinyl esters are an important class of resins belonging to this second type.

One type of these widely used coatings is made with Vinylite series V resins, copolymers of vinyl chloride and vinyl acetate. These resins are produced from natural gas and salt. Unlike nitrocellulose, these vinyl resins are non-flammable. They are soluble in certain organic solvents and are resistant to oil, grease, acid, alkali, and many other corrosive chemicals. They have extremely low water absorption and moisture-vapor-transmission characteristics, and exhibit unusual resistance to severe corrosion and weathering conditions. Because of their strength, stability, and inertness, these resins also are used for

Plastic-

LEFT

THESE drums, for soft-drink concentrates and similar food products, are lined with Vinylite plastic coating. Photograph courtesy of Wheeling Corrugating Co.



BEEER cans, for several years, have vinyl surface

sheets, molded articles, and even new textile fibers.

Vinyl resins, also unlike nitrocellulose, are seldom modified by the addition of gums, oils, or other resins, as few such compounds are compatible. In general, the lower chemical-resistance of such additions detracts from the inertness of the vinyl resin film. Plasticizers are usually desirable in surface coating formulations. As the vinyl resins are inherently tough and flexible, approximately only half as much plasticizer is required as in corresponding pyroxylin lacquers.

on-Metal Finishes

—This new type of protection for steel products withstands fabricating operations



ping. They dry tack-free in about the same time as comparable pyroxylin lacquers, but it is necessary to bake the finish for a short time to obtain adhesion. This bake also serves to remove solvents and the finish at once attains its ultimate hardness and maximum resistance. Typical drying schedules require a 15 to 30-min. bake at temperatures of between 275 and 350 deg. F.

As yet, no satisfactory air-drying vinyl plastic finish for metal products has been developed, but present formulations are suitable for force-drying or low-bake finishes on wallboards and other relatively rough surfaces.

In general performance and in types of applications, these resin finishes resemble more closely the high-temperature baked finishes than they do either paints or lacquers, although in many respects they stand in a class by themselves, especially when called upon for performance under extreme conditions.

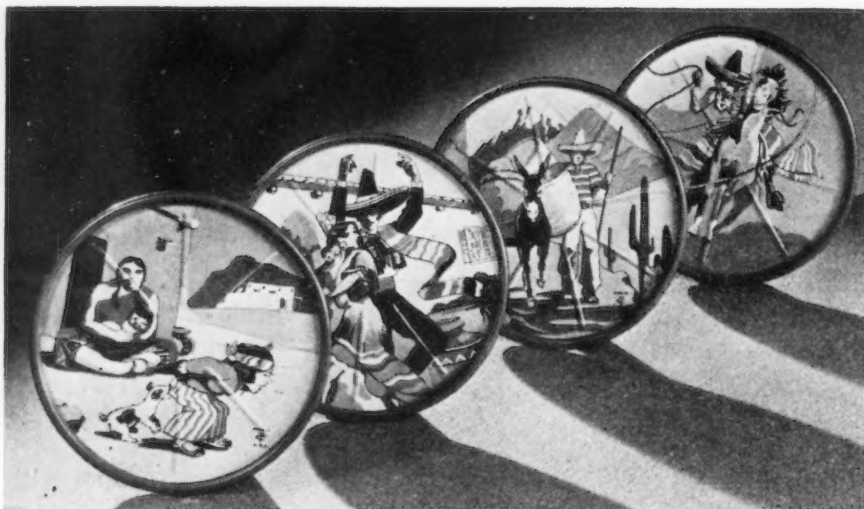
Present commercial applications of vinyl resin finishes on steel include linings for drums and other containers, even beverage tank cars; finishes on metal caps for bottles and jars, table coasters, dry-cell retaining tops, and hospital and hotel furniture; and corrosion-resistant coatings for chem-

THESE typical bottle and jar caps are vinyl resin-coated in the flat, then spun or drawn to shape.



The process for making Vinylite resin finishes is similar to that used in preparing pyroxylin lacquers: Pigments are dispersed by milling with resin and plasticizer. The pigmented resin chips that result are softened with solvents to form concentrated color pastes. Color pastes, resin solutions, plasticizers, and solvents are then mixed in proper proportions to prepare the completed lacquer. Such formulations are now available from many leading lacquer manufacturers.

Vinylite resin lacquers can be applied by spraying, roll coating, or dip-



THE vinyl coating on these metal coasters withstands a crimp of $1\frac{1}{2}$ turns.

ical plant and electroplating equipment.

Probably the most important use of Vinylite resin finishes has been for the inner surfacing of cans for fruit juices and beverages, drums for soda-fountain concentrates, and similar containers. By forming a thin, yet inert and tenacious coating on the metal, these finishes protect the container metal, the contents, and assure an impervious barrier between the contents and the metal. An additional advantage, of paramount importance, is found in fabrication. The resin coating is so tough that it can be applied to the sheet stock in the flat and will

withstand, without impairment, the drawing and forming operations necessary to shape the finished part. Thus, sheet metal for containers is coated in the flat. The parts are then fabricated from the coated stock; yet, even though the lacquer is distorted and compressed by the forming dies, it remains unscratched and adherent.

A field closely allied to the lining of containers is the coating of metal caps and closures for jars or bottles containing pharmaceutical and medicinal products. Various colors and attractive designs are applied to the flat sheet which is then drawn or spun into shape. In this connection it might

be mentioned that paper, calender-coated with the same type of resin, is often used as the closure seal under such caps—especially for humidity—on sensitive products such as cosmetics and certain foodstuffs.

Baked plastic-on-metal, vinyl resin coatings combine sufficient adhesiveness, toughness, and flexibility to allow coated metal parts to be fabricated by crimping, rolling, or drawing, and, in addition, retain the gloss and chemical resistance in the finished metal product. As an example, sheet stock for making small, attractive coasters—for the 5c-and-10c store trade—is lithographed, coated on both sides with the vinyl formulation, baked, and stamped to shape. The edges are then crimped around a full $1\frac{1}{2}$ turns on less than a $1/16$ -in. radius to form a side wall. Even with this extreme distortion, the lacquered surface remains unmarred. Coasters made in this way last for years without rusting, and the finish is unaffected by acid fruit juices, milk, or other beverages.

An illustration of the chemical and moisture resistance of these plastic coatings is their use on the metal tops of Eveready dry cells. The coated caps protect the inner cell elements by keeping moisture from evaporating, by preventing water from entering the top of the cell even if it is immersed, and by remaining inert to corrosion from the battery mix even after the cell is finally spent. These tops are also drawn and stamped from flat, coated sheet stock.

The resistance of these vinyl resin coatings to alkalis and alcohols recommends their use in containers for packaging paints, resins, and other materials. Already they are used to line pails for casein paints. In one experiment to determine their value for such purposes, a one-coat plastic lining was applied directly on the bare iron containers used for cold-water paints. The iron pails lined in this manner were filled with a 25 per cent caustic soda solution and stored for three years. Upon examination after this period, no failures were apparent in any of the test specimens.

An interesting and unusual use of these surfacings is that of coating metal printing plates used in printing Braille books for the blind. The Braille lettering is punched, as small hemispherical elevations, on a coated flat sheet. Punching has no effect on the plastic coating even at the top of each elevation, and the lacquer results in a smooth, resistant finish over the entire sheet.



EVEREADY dry cells are each capped with an inserted, resin-coated disk. Plastic coating withstands moisture.

Deficiencies of Defense—I

By COL. H. A. TOULMIN, JR.

THE four previous articles, characterized by keen and orderly insight and wide vision, dealt with moral, industrial, social, strategic and military alterations necessary for adequate defense of America. Herein, in his typically brilliant manner, the author sums up the detailed steps necessary to make the United States a feared and respected force in the militaristic world now evolving.

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BANKRUPT military thinking is our major barrier to successful defense. This mad rush to imitate Germany as to planes, tanks and panzer divisions is proof of the serious lack of our military planning. If all this is now so good why are we so late? Two years hence when we get this equipment it will be outmoded!

Let us have some military brains of our own. Let us have equipment and organization adapted to the American soldier as an independent fighting man.

Take one good illustration. The only weapon sure to stop a tank is a 75 mm. gun. Why not make that gun as mobile as the tank so we can fight fire with fire? This is to be a war of mo-

bility and staying power—a natural for our highly educated enlisted personnel. All we need to do is make them individual fighting units and you will see a tough war.

Where are our resources of armored gas supply trucks, motorized ammunition carriers, motorized 81 mm. mortars, flame-thrower planes for anti-tank attack, regimental staff night schools for National Guard and Reserve Officers, portable liaison radio phones, elimination of close order drill, parades and ceremonies, and a thousand and one things to be done to modernize our army?

Can an army command that trains Reserve Officers with tin swords and correspondence courses to be Generals be said to have the common sense and vision for this emergency? Can an army command that excluded many of its best officer brains from further training at its Command and Staff School—making it an exclusive club—be trusted to have the vision and practical sense to manage our vast armies without a strong civilian Department of National Defense to supervise?

An "Inspection Department" Needed

Most important of all where is an independent Inspector General of the armed forces to check on performance and enforce the plans of Congress and

the nation? The Army needs an inspection department, just as any other organization, reporting direct to the top executive. We are not getting that now.

In building an army there are three fundamental questions:

- (1) Who, where and what are you going to fight?
- (2) With what are you going to fight?
- (3) Who will do the fighting?

In short, men and materials plus territory are the basic questions of a national defense program. Our Government certainly has not been candid with the people who are putting up the money. Equally true is it that if our Government does not know who and what and where we are going to fight, it is simply frittering away our resources.

In either event the payers of this program have a just cause for complaint. Either the Government is not candid with the people or it doesn't know what it is preparing for. If our Army command cannot tell the Administration the answers to these questions, then it is incapable of planning and using 25 billions for expenditures.

Let us take mechanization of our troops as an example of our disorganized thinking. A few years ago the



SOLDIERS of D Company, 106th Infantry, N. Y. N. G., who are taking part in the maneuvers of the First Army, go into action with their .50 caliber stove-pipe machine gun. The Guardsmen are using mock weapons to solve the problem of how to wage a mimic war without sufficient equipment. (Wide World Photo.)

Regular Army determined upon the streamlined triangular division. This organization is based upon the principle of complete mechanization and motorization.

Several years ago I served with our then only mechanized regiment in the United States Army, the First Cavalry (mechanized) at Fort Knox. At that time it required for every hour in the field many hours in the shop to maintain those vehicles in service and repair. Those vehicles were so highly specialized in construction and most of them were so experimental that few of them were either fit for or capable of quantity production for a field army.

General Craig, then Chief of Staff, advised me, when I called his attention to the fact that this mechanical equipment upon which the entire reorganization of the army was being based was still in the most experimental and unsatisfactory stage, that they had neither tables of wastage or expenditure or repair so that no logistic tables could be figured for the operation of such equipment.

The Army did not know how long it would take to get these vehicles repaired under certain conditions of service; there was no table of repairs or wastages so that you could determine how many vehicles you would have

after moving them 50, 100 or 250 miles a day. There were no other data of this sort known upon which to premise the operations of an army and the supply of this equipment. This equipment today is nearly identical with that of that period.

General Craig stated to me that this equipment was excellent and perfect. A year later he courageously admitted, as a result of a year's field maneuvers, that his statement was incorrect and that my charges that this mechanized equipment was grossly defective and incapable of being reproduced in sufficient quantity or maintained in action for the purposes of the regular army was not only 100 per cent correct but, as he expressed it, "110 per cent correct."

Plunging Head Foremost

Our able, former Assistant Secretary of War, Louis Johnson, who was present at these conversations, confirmed the situation that even the motors did not live up to the 90-day guarantee clause. On the very day of the first revelation of these conditions he took immediate steps for the complete reorganization of the construction and manufacture of this equipment.

Yet, even today, this equipment is far from satisfactory. We are plung-

ing into a great commitment of manufacturing this equipment without having the very latest and best developed equipment for the Army. At this late date we are still changing, still making special complicated designs and still do not know if 1 in. armor is sufficient. Here again the lack of plans, which is not the responsibility of the Regular Army, but of the political factors of the Government, makes it almost impossible for the Army to select the equipment that will be necessary for the organization of its forces.

Save the Old Officers!

Let us take another example of regular Army mis-direction. The plan for years of the Regular Army has been to use the Officers Reserve Corps only in the junior grades of First, Second Lieutenants and Captains who will be primarily charged with managing the troops in combat where the dangerous work is done. The plan further has been to promote the junior officers of the Regular Army to positions of Major, Lieutenant Colonels and Colonels, and, of course, elevate the Lieutenant Colonels as Colonels to Generals. In this way the Army will retain command and the Officers Reserve Corps in the junior grades will carry the burden of combat work.

This is now confirmed in the recent

Hearings of Congress on the Officer Reorganization Bill for the retirement of Regular Army officers at 60. In the first place, this would eliminate some of our most able officers, upon whom the Army has spent large sums of money. If a Secretary of War is good at 73, what's wrong with healthy Regular Officers at 60? At the very time that the Army needs the best military brains that we have and we have a deficiency of senior officers, we are proposing to cut off the time of their service by four years.

We were successful in every other war in keeping our Generals to 64 years of age. In most of the armies of the world they are kept way beyond that age. The real purpose behind this bill is to promote a large number of the Regular Army officers in order to permit of a system just indicated above.

Let's see what Senator Johnson had to say of the hearing on this bill when the Chief of Staff, General Marshall, was testifying.

"Four thousand two hundred officers will move into the grade of lieutenant-colonel. They will remain there until they are 60 years of age. So while this peculiar situation may not be exactly permanent, it will continue for a great many years.

"In the World War, as I have

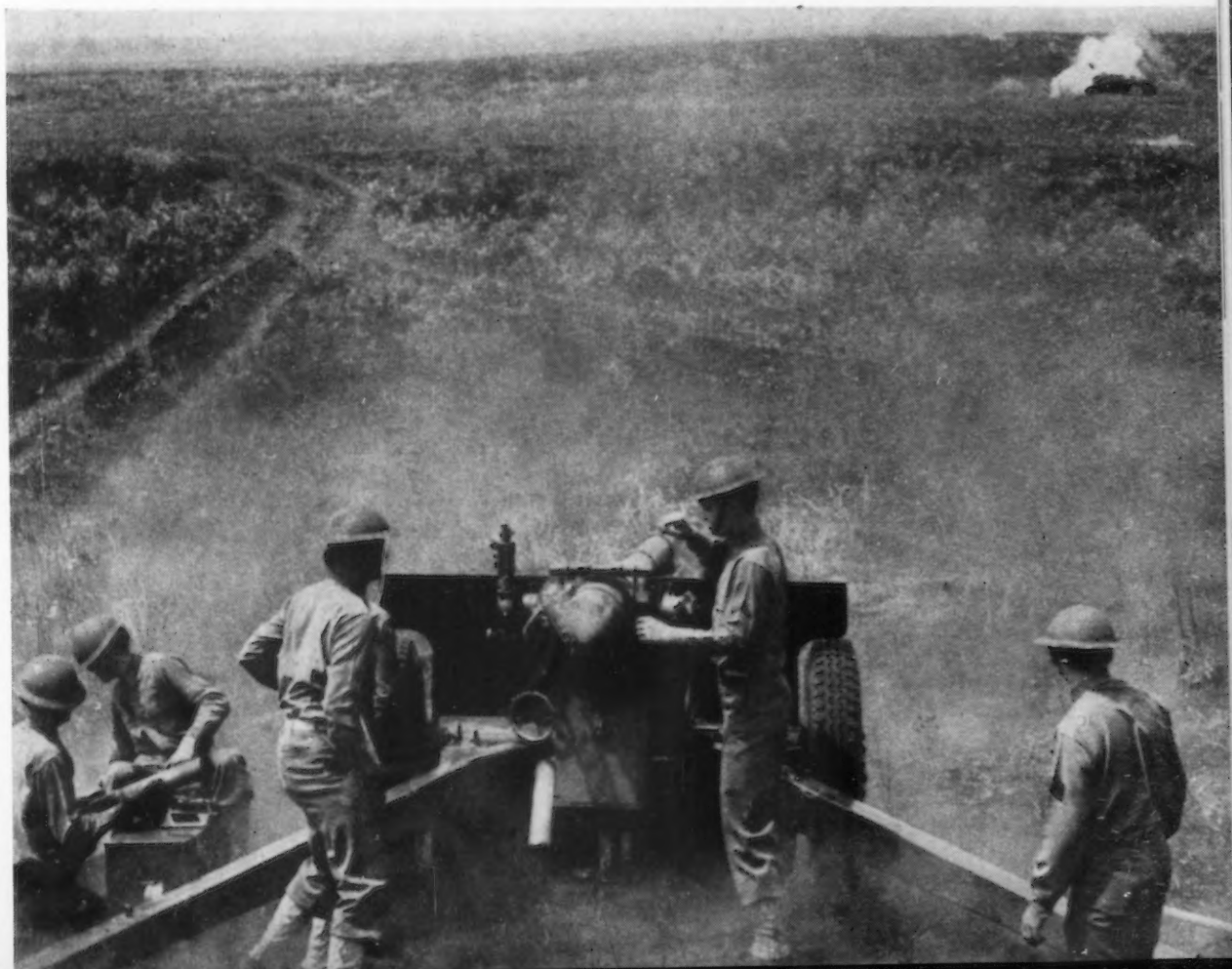
said, the Army had 12,227 majors and 41,953 captains, and only 3151 lieutenant-colonels. But under this bill we will have more lieutenant-colonels than we had during the World War. As a matter of fact, under the existing law, the lieutenant-colonels are restricted to 9 per cent of the number of commissioned officers. Not more than 9 per cent of the commissioned officers can be lieutenant-colonels. But under the provisions of the bill before us 40 per cent of the commissioned officers in the Army will be lieutenant-colonels; and there will be 705 colonels in addition. *So nearly 50 per cent of all commissioned officers in the United States Army will be in the grade of lieutenant-colonel and colonel.*

"Those are the provisions of this bill. To General Marshall, who appeared before the conference committee, I presented these very figures and asked him if that was not so, and if it was, what he could do about it? General Marshall bit his lip, looked toward the floor, shook his head sadly from side to side, and said, 'That will be my headache'. The bill will give the military chief a military headache. It can be understood how that will be when I give the figures. I presume that when

Ripley gets hold of this information the United States Senate will be made the laughing stock not only of the United States but of the entire world. He will say, 'Believe it or not, 40 per cent of the commissioned officers in the United States Army are lieutenant-colonels — more colonels than are in the Mexican Army, and more than are turned out in Kentucky.'

"General Marshall appeared before the conference committee; and he made the most distressing report, the most damaging indictment of the commissioned officers I have ever heard anywhere or at any time. He was charitable. He called them mediocre. He said, 'I am receiving demands from colleges. They want instructors for the R. O. T. C. I am receiving demands from the National Guard. They want instructors. I am receiving demands from the Reserve Officers' organizations. They want instructors.' He said, 'I have no men whom I can send them. I have the greatest difficulty in finding the right men to send them.' I asked him, 'Why?' He said, 'Well, so many of the officers are mediocre.' That is a very charitable term. I suppose he meant that they are very inefficient.

U. S. Army experts, wondering what would happen during a direct hit on an armored tank with a shell from the famous French "75". Firing point-blank at about 300 yards, the gunners scored several bulls-eyes, and literally demolished the tank, an old obsolete model, but constructed of armor plate, comparable to present day protection. Note the large piece of steel flying from the tank, as the projectile strikes. Also note the now empty brass shell flying through the air backwards, as it is ejected automatically from the breech of the gun. (Wide World Photo.)



"I asked General Marshall this question: 'If a commissioned officer is not morally what he should be, can you not class-B him? Can you not put him in class B?' Senators will understand that when an officer is placed in class B he is automatically retired. The General shook his head. No, he could not very well do that. He said he might do it in a few cases. I asked, 'If an officer is not efficient, if he is not cooperative, if he is not able to do his work as he should do it, can you not class-B him?' The General said, 'No, we cannot.' He said, 'As a matter of fact, class B is a dead letter in the Army today.'

"He said, 'Last year we only class-B'd 3 officers out of 12,000. Only 3 of them were put in class B.' He said, 'We have the greatest difficulty in putting them in class B. We classified some as class B after hearings; and then the department gets hold of it, and we are told, you cannot do that to that officer. You cannot do that to this officer; and if you get by the division, then the men up here on the Hill'—and he meant the Congress—'come down there and say, 'Oh, you cannot do that to that officer. You cannot do that to this officer. He is my friend. You will have to keep him in the Army.' General Marshall testified that as a result of those conditions class B is dead among the commissioned officers of the Army."

It is obvious that what the Regular Army needs is not the wholesale retirement of the best service brains of the senior officers who happen to be over 60 years of age, but a thorough house cleaning on the basis of merit from stem to stern from Second Lieutenant to the top Generals. The only way this is going to be done

is by a civilian board having domination of the questions of Army efficiency with the Regular Army only acting in the position of advisors, with promotion as in the Navy by examination as well as record.

It is too much to expect of human nature that any board of Regular Army officers would do a house cleaning of this sort. The action of Theodore Roosevelt in moving General Pershing from Captain to General, and the action of President Wilson in picking Pershing to move up from Brigadier General to the entire command of our forces is significant. Likewise, President Roosevelt found it necessary to pick General Marshall as Chief of Staff even though, according to seniority, he was not entitled to the position. This rule applies all down through the army and should be rigorously enforced by our civilian administration.

Machine Guns

Now let us take machine guns. Under the new streamlined divisional setup we are to use a "light" machine gun as the primary machine gun weapon, a "heavy" gun like our old .30 caliber, and the new .50 caliber. But as late as March, 1940, the Regular Army through the *Command and Staff Journal* reported that no decision had yet been made on the "light" machine gun. What a spectacle of Army efficiency when the key machine gun as late as March was not yet decided upon!

It's high time that the truth be told America. The Regular Army of the United States has undertaken for some years the complete reorganization of all the combat divisions of the United States Army reducing the World War Division size of approximately 21,000 men to a size of approximately 11,000 men.

Even yet it is not settled what this exact organization will be. Such a division, so organized, is based upon the idea that it is a swiftly moving, highly motorized and mechanized force of men capable of moving from 50 to 200 miles a day. It has a corresponding fire power that goes with this number of men in order to give the mass shock action and the application of metal on the target in keeping with the swift moving division of this character. In short, the Army has put its money upon a series of so-called "streamlined" divisions. There is as much comparison between this new type of division of the United States Army with the old division as the difference between a race horse and a mule.

What is a Division?

Now what do we see as the real results of the reorganization of the Army? The first line of defense is the Regular Army. In each Army corps there is supposed to be one Regular Army division, approximately two National Guard divisions; and in some cases one National Guard division and a Reserve Division. These National Guard divisions and Reserve Divisions are still organized on the basis of the 20,000 men capable of moving from 10 to 12 or 15 miles per day.

They have never been reorganized and brought up to even the standard in the backward countries for the organization of combat divisions. They are still on the basis of the World War of 21 years ago. They are still largely equipped with cast off materials of the World War or subsequent experimental materials.

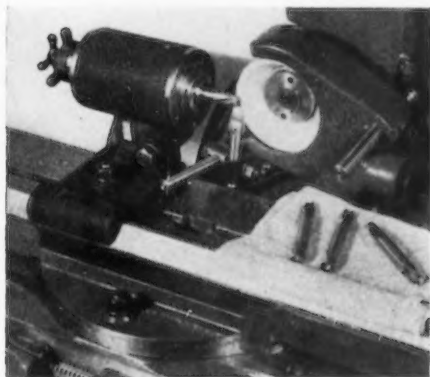
Editors' Note—The second half of this chapter in Col. Toulmin's series will appear in our next issue.

What's New in Small Tools and Gages

VARIOUS small accessories for the machine shop, including portable electrically and air driven tools, are described in this review, culled from recent announcements of the makers. Some of the latest improvements in gaging and measuring equipment are also covered.

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IN the new end mill grinding attachment for *Brown & Sharpe* No. 13 universal and tool grinding machine, the spindle is mounted on anti-friction bearings, providing a sensitive, free turning unit that is said to be of special advantage when sharpening very small end mills having a steel spiral. A knob at the rear end of the attachment spindle makes it an easy matter to hold the tooth be-



ing ground in contact with the rest while feeding the cutter across the wheel by longitudinal table movement. In the illustration a double ended mill is shown held by a spring collet and draw-in bolt, needed for straight shank end mills. End mills having a No. 9 B & S taper shank will fit directly into the attachment spindle. Stock collets and adapters are avail-

By FRANK J. OLIVER

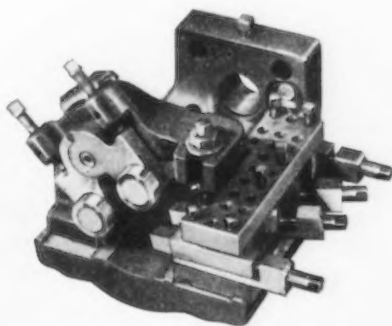
Associate Editor, *The Iron Age*

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able for other tapers. Provision is made to swing the spindle body around 180 deg. to take either right or left hand cutters. Base is accurately aligned by means of inverted V on machine table.

Multiple Cutter Turner

SEVERAL reducing cuts can be made simultaneously by means of a new multiple cutter turner for turret lathes, announced by *Gisholt Machine*



Co., 1215 E. Washington Avenue, Madison, Wis. Among the design features of this tool that make it possible to make heavy cuts with accuracy are its rigid steel construction, hardened steel rollers mounted on roller bearings and adjustable roller arms that attach securely to the block. Set-up operations are facilitated by micrometer screws on the tool blocks and all movable parts are adjustable for wear. This turner is available in several sizes, permitting turning of diameters from $\frac{3}{4}$ to $4\frac{3}{4}$ in. Individual or multiple tool blocks are furnished.

Small Hydraulic Jacks

A NUMBER of new developments have been made in the line of Porto-Power hydraulic equipment recently introduced by the *Blackhawk Mfg. Co.*, Milwaukee, for pushing, pulling, clamping, pressing, bending and spreading operations. A *Spee-D-Coupler* now makes it possible to connect the same pump and hose to any one of the rams in 4, 7, 10, 20 or 50-ton capacity, in place of a separate pump and hose for each ram. This coupler, which joins the high pressure hose to the ram, seals an oil channel that transmits 10,000 lb. per sq. in. oil pressure. Another addition is a thimble size 4-ton ram which is only $1\frac{5}{8}$ in. in height and diameter. This midget ram can be fed into small openings or channels because it is operated at the end of an 8-ft. hose. Among the new attachments in the Porto-Power line



DUCKBILL SPREADER



RAM KIT



SPEE -D- COUPLER

is a Duck-Bill spreader which adapts the plunger action of the 10-ton ram to spreading sheet metal and other assemblies. The jaws spread from $1\frac{1}{2}$ to 6 in.

Midget Socket Wrenches

FOR delicate jobs involving small assemblies, the *Blackhawk Mfg. Co.*, Milwaukee, is offering a new line of midget socket wrenches, called Nuggies. Made of a high grade Hex-ite steel, they have a $\frac{1}{4}$ -in. square



drive and socket sizes ranging from 3/16 to 7/16 in. Miniature combination open end and box type wrenches, known as Half and Halfs, with openings from 7/32 to $\frac{3}{8}$ in. accompany the socket wrenches in the 18ND set, which is contained in a compact Durez plastic container of coat pocket size.

Sheet and Wire Snip

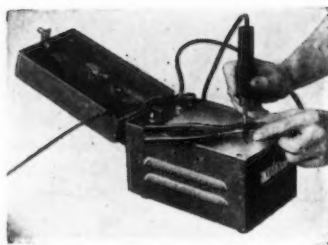
AN improved compound action requires less effort to make various kinds of cuts on all grades of sheet steel up to 16 gage, BX cable and heavy flexible tubing, and wire up to 16 gage with the new Penco No.



95a aviation snip, made by the *Penn Tool Co.*, 2415 N. Howard Street, Philadelphia. The tool has a locking device that will not interfere with cutting operations. Cuts can be made from $\frac{1}{4}$ to $1\frac{1}{8}$ in. per stroke, and of any shape. Removable blades are beveled and have serrated cutting edges that will not slip or turn. They are made from chrome vanadium molybdenum steel.

Electric Etching Tool

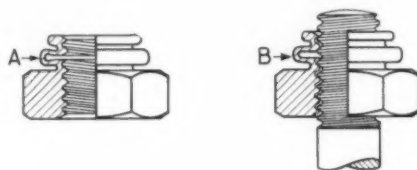
THE new portable universal model T13 electric etcher for permanently marking tools, dies, bearings, etc., developed by *Ideal Commutator Dresser Co.*, 1925 Park Avenue, Sycamore, Ill., features complete enclosure



of all parts, except the control dials. Etching heats of 120, 240, 420 and 700 watts are available. Small objects can be etched on the work plate on the box, while a ground clamp is provided for larger work. Unit is recommended primarily for iron, steel and their alloys and weighs, complete, 16 lb. Overall dimensions are $7\frac{1}{4} \times 5\frac{1}{8} \times 8\frac{1}{2}$ in. A smaller unit is available for fine etching.

Self-Locking Nuts

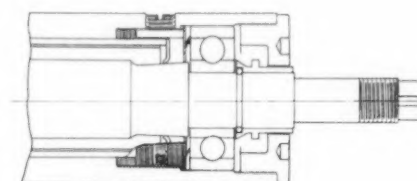
ESSENTIALLY two nuts in one, the Boots self-locking nut has the top section displaced in a downward direction so that its upper or locking threads are out of lead with respect to the load carrying threads of



the lower section. The two sections are connected by an integral spring member. At A in the sketch, the spring is shown in its unengaged position, whereas at B, the top section is shown displaced upward to permit it to engage properly with the threads of the bolt. The force thus established firmly grips the bolt and prevents the nut backing off even under severe vibration. These self-locking nuts are made and distributed by the *Scovill Mfg. Co.*, Waterbury, Conn., under license of the Boots Aircraft Nut Corp.

Preload Adjustment for Ball Bearings

COMPENSATION for the expansion of the quill shaft due to heat is obtained in a new type of preloaded ball bearing mount for Dumore grinding spindles. In the former construction, the preload spring bore against



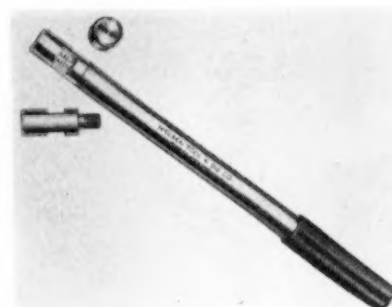
the outer edge of the free bearing and when the quill shaft expanded, the preload spring increased the load on the bearings, particularly at the higher speeds. With the present arrangement, illustrated, the amount of preload is determined by a short stiff spring adjusted by an internal nut in the quill tube and bearing on the inside edge of the outer bearing raceway. Hence when the shaft expands more rapidly than the outer quill, the preload spring pressure is relieved instead of being increased. For this reason, quills operating at a wide range of speeds are capable of doing precision work to closer tolerances, according to the maker, the *Dumore Co.*, Racine, Wis.

Layout Dope

A NEW, blue, liquid layout dope suitable for tool and die makers' use has been announced by *Tamm's Silica Co.*, 228 North LaSalle Street, Chicago. Material is quick drying and will not rub off. Scribed marks show a clear, distinct line without chipping or scraping. A new type blue chalk for checking leaks in castings has also been developed by the company.

Layout Punches

THE layout punch shown is used for transferring drill holes through a drilled section in diameters from 17/64 to 59/64 in. The punch is made with a renewable case hardened tip and when a solid blow is struck on the punch head, the drill center and drill circle is transferred



to the work accurately. When screw and stud holes and blind drill holes are to be transferred, the *Nielsen Tool & Die Co.*, Berkely, Mich., is offering sets of transfer screws, with center and circle marks on their outer, hardened ends. These screws are simply tightened in the various holes, the work is then inverted and struck a sharp blow. With both forms of layout tool, the center and drill circle penetrate the steel to a depth of 0.010 in. so that the layout marks cannot be

erased by drilling fluids. Transfer screws are made with a shoulder support of uniform height enabling holes of various sizes to be transferred in the same plane at one impression. Great saving in time over conventional layout methods are claimed.

Safety Marking Stamp

A DOUBLE-FLOATING, box-type safety holder, designed for faster and more efficient marking on hot, cold, flat, round or angular surfaces has been announced by *M. E. Cunningham Co.*, 117 E. Carson Street, Pittsburgh. Holder is constructed with a sleeve which levels or holds the floating type holder at right angles with the surface to be marked. Both holder and type are made of patented safety steel which, it is claimed, will not spall or mushroom. Holder works equally well on rough sheared, sawed or ground surfaces.



ningham Co., 117 E. Carson Street, Pittsburgh. Holder is constructed with a sleeve which levels or holds the floating type holder at right angles with the surface to be marked. Both holder and type are made of patented safety steel which, it is claimed, will not spall or mushroom. Holder works equally well on rough sheared, sawed or ground surfaces.

Portable Air Grinder

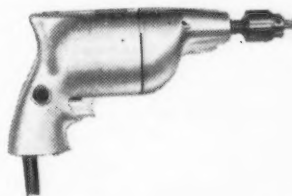
POSITIVE starting under all operating conditions is assured in the model No. 255 portable air grinder announced by *Independent Pneumatic Tool Co.*, 600 West Jackson Boulevard, Chicago. Grinder construction is based on "air behind the blades" principle which is described as keeping



the rotor blades out against the cylinder wall, preventing any dead center position or depression of the blades in the slots due to oil accumulation.

Portable Electric Tapper

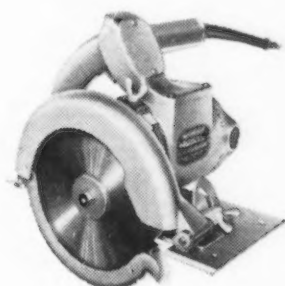
A TAPGUN which taps at 400 r.p.m. and backs out at 525 r.p.m., has been added to the line of hand tools manufactured by *Black &*



Decker Mfg. Co., Towson, Md. This unit is of identical grip, build and balance as the company's Holgun and Scrugun. It weighs 3¾ lb., measures 9¼ in. overall and taps up to 5/16 in. in cast iron and 3/16 in. in brass and aluminum.

Portable Electric Saw

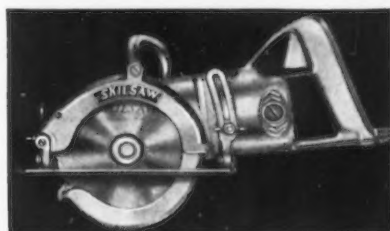
A WELL balanced, one-hand, portable electric saw, model No. 85, featuring trigger-switch control and automatic telescoping safety guard,



has been introduced by *Van Dorn Electric Tool Co.*, Towson, Md. Diameter of saw blade is 8 in. and spindle diameter is 1¾ in. Maximum depth of vertical cut possible is 2½ in. and on 45 deg. cut is 2 in. Unit has an aluminum housing and oversized commutator.

Light Weight Saw

AN improved 6 in. portable electric saw for heavy duty service has been added to the Skilsaw line by *Skil-saw, Inc.*, 5033 Elston Avenue, Chicago. This model cuts to a depth of



1⅞ in.; will rip and cross-cut hard wood up to 1 in.; cross-cut dressed lumber up to 2 in., and bevel cut 1 3/16 lumber at 45 deg. It can also be used with abrasive disks and for tuck pointing. Saw weighs 11½ lb. and has an automatic telescopic guard. Improvements in model No. 127, with a 12-in. blade, has also been made by the company. This model will cut to a depth of 4⅜ in. and has a frame of die cast aluminum alloy.

Portable Electric Grinder

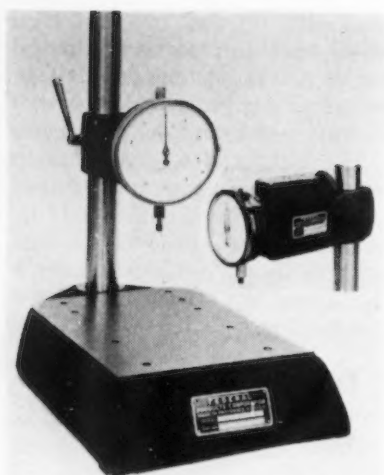
A NEW grinder, model No. 153, powered by a ¾-hp. motor through a direct drive unit mounted on ball bearings, is being offered by *Stanley Electric Tool Division*, New Britain, Conn. Grinder has sufficient



power to drive grinding wheels up to 1½ in. and has an extended shaft which gives a reach of 5 in. for deep internal grinding. Unit was designed for both hand and machine grinding and can, with a motor holder, be mounted in a lathe, milling machine or shaper for external or internal grinding. Abrasive wheels, mounted points and rotary files can be accommodated.

Dial Comparator Gage

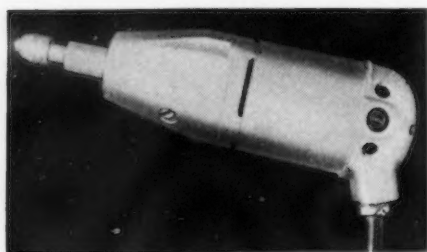
A NUMBER of improvements have been made in the Model N comparator manufactured by *Federal Products Corp.*, 1144 Eddy Street, Providence, including an entirely redesigned base and stand. The new base is supported on three feet instead of four, assuring positive footing wherever the gage may be placed. The supporting column has been made heavier and the regular supporting bracket holds the indicator by the back instead of the stem. Instrument is suitable for use directly in production inspection of pistons, bolts, drills, gear blanks, etc., and can also be used for setting and checking other gages. A wide variety of indicators are avail-



able. Regular support bracket may be supplanted with a special attachment (shown in illustration) which allows adjustment of 10 to 20 thousandths.

Reciprocating Power Tool

A RECIPROCATING action tool which can be used to burr, file, hone, snag, polish, saw and chip has been introduced by *H & H Research Co.*, 1925 W. Buena Vista, Detroit.



Tool has a stroke length of $\frac{3}{8}$ in. and will develop a 30 to 40 lb. push or pull at end of chuck. Under full load it travels at 1250 to 1400 strokes per min. and can handle a $\frac{3}{4}$ in. square hone on heavy work and a $\frac{7}{16}$ in. one on lighter work and confined places. Chuck capacity is $\frac{1}{4}$ in., round or square, and an adaptor for $\frac{1}{8}$ in. is available. Tool can be readily adapted to vertical or horizontal filing.

Dial Indicator Attachments

NEW attachments for use on dial test indicators having stems 0.375 in. in diameter, thus adapting indicator for testing internal and other surfaces which cannot be reached with the spindle of the dial gage, are being offered by *Brown & Sharpe Mfg. Co.* Units feature an adjustable fulcrum



screw by which any looseness or play in the arm can be eliminated. Attachment No. 729C will enter a hole to a depth of $1\frac{11}{16}$ in., while model No. 729D will enter to a depth of $\frac{13}{16}$ in.

Height and Depth Gages

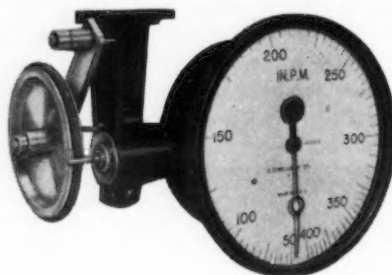
HEIGHT and depth gages which make for easy reading with micrometer accuracy in hard-to-get-at places is a new product introduced by *Continental Machines, Inc.*, 1301 Washington Avenue, S., Minneapolis. Gages are furnished with rods measuring up to 6 in. As a depth gage, or as an inside parallel surface gage,



measuring rods are locked into an accurate position after the measurement is taken. The depth is then quickly read from a micrometer. Adding or subtracting to obtain a reading is avoided. Gage can also be used for height measurements and, by using the height attachment, can be employed for making accurate layout lines. Gage, complete with the disk scribe and measuring rods, is available in kit form.

Stationary Tachometers

FULL ball bearing mounting of the pendulum pivots, swivel link and driving spindle, all toward the end of reducing friction drag, is the

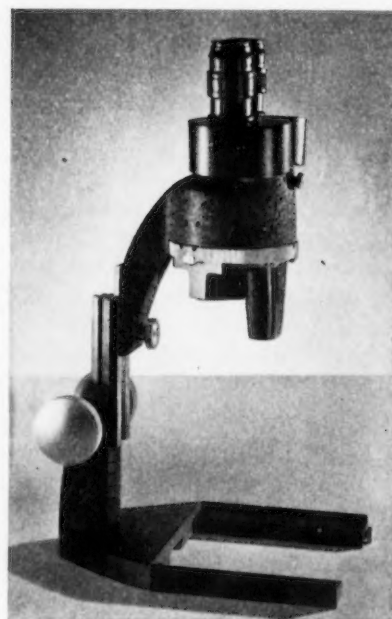


principal improvement in the line of improved O-Z stationary tachometers supplied by *O. Zernickow Co.*, 15 Park

Row, New York. These tachometers will run continuously for long periods of time without lubrication and without losing accuracy, which is within $\frac{1}{2}$ per cent. These instruments are "dead beat" to a degree hitherto unattained by similar instruments, it is claimed. The model shown has a 6-in. dial graduated in inches per min., but other graduations of peripheral speed or r.p.m. can be obtained. Graduations can be made to read from 2 to 40 times the minimum speed. Regular drive is by means of a $\frac{3}{4}$ -in. cotton tape. The illustration shows a special mounting with a rubber tired contact wheel for measuring peripheral speeds.

Stereoscopic Microscopes

A NEW series of stereoscopic microscopes is being introduced by the *Spencer Lens Co.*, a division of *American Optical Co.*, Buffalo. The stereoscopic image has great depth of focus, an exceptionally large object field and a high degree of resolution of fine detail, giving critical sharpness to the image, the maker states. Mechanical improvements facilitate focus-



ing on large or small objects and provide for quick changes in magnification. The objective lenses are held in a dust proof revolving objective holder. The new instruments are offered in four different mechanical arrangements to cover a wide range of uses. Magnifications range from 6.3X to 144X. Seven different powers in paired objectives and four different powers in paired eyepieces provide a total of 28 magnifications.



Photo shows the Super-Diamond Pattern of "A.W." Rolled Steel Floor Plate. Provides safe tread from any angle, under any condition.

The real cost of floors . . . For safety that pays dividends—on traffic aisles, stair treads, factory floors, refinery towers—modern industry relies on "A.W." Rolled Steel Floor Plate. Here is profitable insurance against costly disabilities. No worn and slippery surfaces to endanger men on foot. No cracks or ridges to upset hand trucks. Oil-proof, heat-proof, fire-proof, crack-proof. Can be cut to any shape, and installed without disturbing production. Write for folder giving complete engineering data.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS, CONSHOHOCKEN, PENNA. : : SINCE 1826 : : DISTRICT OFFICES AND REPRESENTATIVES—Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, New Orleans, St. Paul, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal—A. C. Leslie & Co. PRODUCTS INCLUDE—Steel Products in Carbon, Copper or Alloy Analyses : : Sheared Steel Plates : : Hot Rolled Sheets and Strip : : "A.W." Rolled Steel Floor Plates : : Billets, Blooms and Slabs : : "Swede" Pig Iron : : Reading Cut Nails.

DETROIT — Earlier than ever, the automobile industry this year is already underway with a series of press previews of 1941 models. Hudson has given a preliminary peek at its new products, and this week Buick and Plymouth pull aside the curtains to show theirs; at the same time, Hudson stages its official national press preview. Indications are that virtually every one of the new cars will be exhibited within the next few weeks—last year most of the previews were in September.

To other manufacturing industries, the whole idea of the automotive press preview probably seems a little strange. There has developed in this industry a practice of inviting 400 or 500 publications' representatives to view new models before announcement date and to hear in advance the plans of the automobile manufacturers. The group invited includes editors, reporters and advertising representatives of business papers, general magazines, newspapers, radio stations and chains. From all over the nation they come by invitation to follow the "Preview Route," which includes the plants in Detroit, Dearborn, Pontiac, Flint, Lansing, Toledo, South Bend and sometimes in Wisconsin (Nash).

Previews to Be Less Ostentatious

ALMOST always the actual previewing of the product and pre-hearing of sales and advertising plans and manufacturing goals is embellished with entertainment—sometimes extravaganzas are presented to whet the appetites and sustain the interest of the press visitors. This year, for instance, the Oldsmobile preview will be staged in a form simulating a political convention and the invitation purports to appoint the press visitor as a "delegate" to the convention. Olds makes a practice of having a special train run between Detroit and Lansing to carry the press representatives to the preview. The day is started with breakfast on the train as it pulls out of the station for Lansing.

The serious side of the preview includes, generally, informal talks by executives and engineers and some rehearsal of the pep talks and movie shorts which are to be given shortly to the industry's sales forces to warm them up to the job ahead when the new products are put on the market.

There have been some indications that the period of elaborately staged previews is coming to an end. This year Pontiac leads the parade in the other direction by abolishing the formal preview entirely. Reporters and editors who are specifically interested in the developments Pontiac has to offer are being shown

On The Assembly Line

BY W. F. SHERMAN

Detroit Editor

• Press previews of 1941 automobiles reveal more extensive use of hydramatic transmission and fluid flywheel drive . . . Hudson's "symphonic styling" points the way for car appearance . . . More two-toned color contracts to be featured

the new cars privately instead of en masse. However, it appears unlikely that the institution of the press preview will ever disappear entirely because it does offer promotional opportunities which the industry is not inclined to disregard. At least some form of editorial presentation of the car is a fixed thing and after all of these years the discussion of advertising and sales promotion plans has attained somewhat the same status.

Ford has been an individualist in this, as well as in other features of his conduct of the automobile business. Previews have not been staged every year by the Ford organization; the announcement of a Ford press review is almost always indicative of the forthcoming announcement of major changes in the product—when

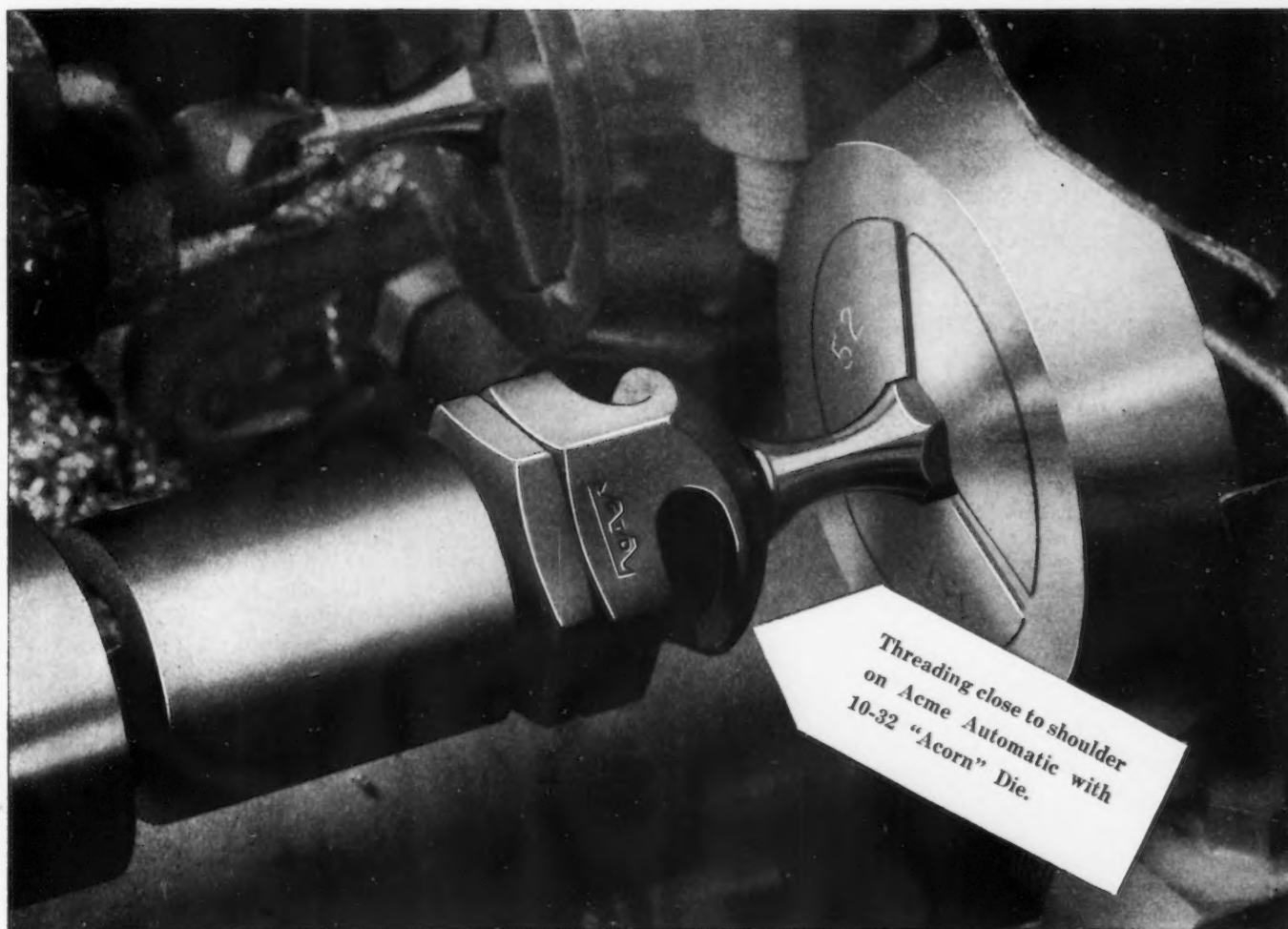
only minor changes are involved Ford is less likely to call the entire newspaper clan together.

PREVIEWS OF PREVIEWS: New features which will be displayed in the forthcoming weeks include . . . two more General Motors cars are expected to make use of the Hydramatic transmission which Olds featured in 1940 . . . this transmission is highlighted by its use of a fluid flywheel not unlike Chrysler's . . . probably all of the sixes, as well as the eights in Chrysler's line of cars will have the fluid flywheel this year . . . the Plymouth, or at least the most popularly priced model of it, may be the exception. . . . Ford, of course, focuses all attention on the now-certain prospect of a six-cylinder car, although it may be a little later in the season before these are announced, or available to the public . . . the delay will not be long, however, because 25,000 engines are on the initial schedule, it is understood.

More Streamlining of Cars

GENERALLY speaking, all cars this year will have the type of streamlining made popular in the General Motors "torpedo" line of cars, notably Buick, Olds and Pontiac. Concealed running boards are attracting more attention . . . actual elimination of the running board has not been a complete success because many people insist on having them for convenience . . . and insurance rates appear to be headed upward on the cars which do not have the running boards as protection against damage in minor collisions. The financial angle has already hit taxicab companies which started using cabs without running boards. . . . Insurance has been refused in some of these cases, automotive interests understand. Convertibles with automatic tops will be more plentiful.

It is not a year of important engineering changes



MORE PRODUCTION with "ACORN" DIES

Every year more manufacturers turn to genuine "Acorn" Dies because of the way they handle jobs like this one. This 10-32 High Speed Steel "Acorn" Die on a multiple spindle automatic is threading safety razor handles. Sustained accuracy and ability to cut close to a shoulder are essential requirements. "Acorn" Dies fill the bill, to the tune of over 15,000 threaded parts per die! G. T. D. Greenfield was



the originator of the "Acorn" Die—the die with positive concentric adjustment. G. T. D. Greenfield engineers know how and where "Acorn" Dies can be most advantageously used. This picture shows how compact the "Acorn" Die is—shows how close to a shoulder it will cut. Remember, too, they operate equally well on fixed or live spindles. Ask your supply house or G. T. D. Greenfield for full data.

GREENFIELD TAP & DIE CORPORATION, Greenfield, Mass.

Detroit Plant: 2102 West Fort St. Warehouses in New York, Chicago, Los Angeles and San Francisco. In Canada: Greenfield Tap & Die Corp. of Canada, Ltd., Galt, Ont.



TAPS • DIES • GAGES • TWIST DRILLS • REAMERS • SCREW PLATES • PIPE TOOLS

or revamping of manufacturing methods . . . there will be more deluxe equipment, more two-toned color schemes and color contrasts. Hudson's "symphonic styling" is a pacemaker. When you buy a green car, you get various shades of green in the interior upholstery, floor mats, etc. And with a gray car, gray interior; with a red car, red interior, etc.

Longer wheelbases will be seen on many cars as contribution to smoother ride characteristics. This means, principally, changes in frame lengths because it is possible to do considerable shifting of the four wheels of the car without redesigning the body. The first available set of figures on a car is Hudson which has increased wheel-base figures by 3 in. The Hudson Six is stepped up from 113 to 116, the Super Six from 118 to 121, and the two eight-cylinder chassis are increased 3 in. each, to 121 and 128 in. respectively.

Octane ratings of fuels have been stepped up considerably and further improvement is anticipated shortly. Taking advantage of the greater economy in performance that can be attained, the industry is following a trend to higher compression ratios in the engines. The Hudson Six, for instance, makes a

change from 7-to-1 to 7¼-to-1. The horsepower rating still is 92 hp.

Mentioned above is the fact that changes in design and manufacturing methods are few and far between this year. Principal reason for this is that the automobile industry has "scared out" and dropped a large part of its plans for 1941 models because it was afraid it could not get machine tools in time. Actually, the shortage of new equipment was more mythical than real, but the auto industry decided early in the program that it would take no chances on having the European war rob it of equipment and thereby upset important programs and schedules. As a result, the automobile industry decided to base all its changes on available equipment.

Structurally, the most significant change which will be incorporated in the 1941 automobiles will be Nash's frame construction on its new light six. This car will have an all-welded frame, contrasting with the riveted job now used, and, in addition, will have the body floor pan (for under body stamping) welded to the frame. Bodies, it appears, will be built without a floor, although the present practice is to incorporate the floor with the rest of the body.

Manufacturing advantages and reduction in costs of shipping are anticipated but the most important reason for the change is the greater stiffness and rigidity of the body frame combination which can be achieved this way.

Ford will also have an all-welded frame based on the new six-cylinder job. This will be made up on sections with the extreme ends of the frame butt-welded to the central section.

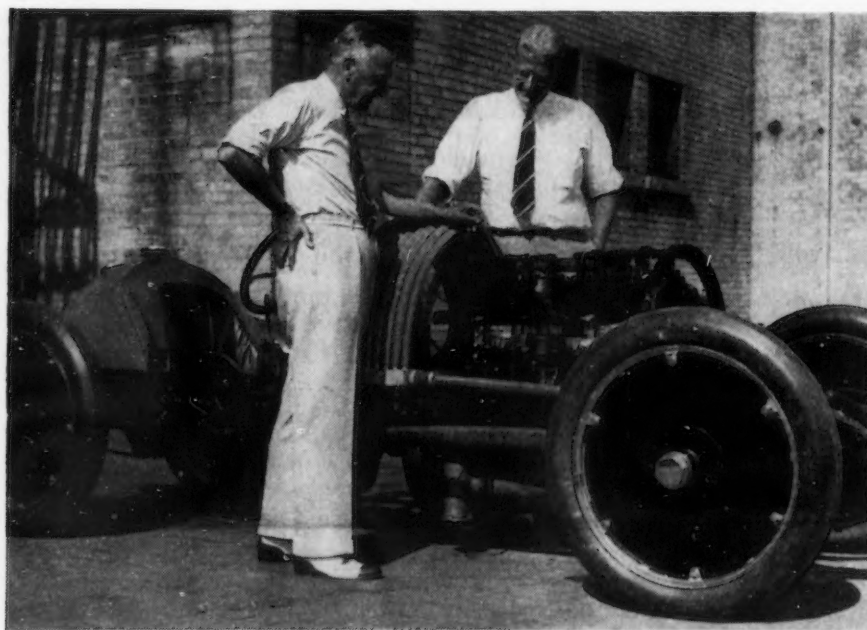
Both of these changes are extremely important forerunners of what may be seen next year or the year after in automobile manufacturing.

There has been some reallocation of business since the beginning of 1941 production. Briggs Mfg. Co. has received an increase in schedule from Willys for assembly stampings, not complete bodies. It is understood, however, that during the coming year Briggs will be one of Willys' most important suppliers in this field. Also, it has been reported unofficially that Briggs will supply Packard Motor Car Co. with bodies for the six-cylinder car during the forthcoming season.

Pontiac announced its schedule for initial production of 1941 cars as the assembly lines were started again last week after less than a four-week shutdown. A little more than 10,000 new cars are scheduled for assembly during August (compared with only 2,800 in August a year ago and 22,000 cars will be assembled in September compared with 13,000 last September). This is more than a 100 per cent gain for the two months over 1939. The resumption of production signified the completion of an expansion and retooling program that affected most departments in the Pontiac factories. Major improvements, of course, were those made in the foundry where capacity was increased 50 per cent to take care of Pontiac's anticipated production as well as to handle certain foundry work for other GM divisions. The motor plant also was considerably revamped with the addition of new machine tools and the stamping plant has been enlarged in capacity.

Automobile production has progressed through successive weekly declines to an apparent low point for the year of 11,635 units in the week ended Aug. 9. The production trend should be upward from now on.

BIG NAMES IN AUTOMOTIVE history are linked with this 1910 racing car, the Buick Bug. A. E. DeWaters, left, former chief engineer of Buick, and Charles A. Chayne, chief engineer of the company today, gave the car its first warm-up in 30 years after reconditioning it for exhibition purposes at the Flint Motor Festival early in August and for the forthcoming New York Automobile Show. The car was designed and built by Mr. DeWaters, Bob Burman and Louis Chevrolet in 1910.



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*Ohio Ferro-Alloys Corporation
Canton, Ohio*

WASHINGTON—The Administration's dogged determination to tie a proposed amortization formula and an excess profits tax bill into one bundle, and its persistent refusal to comply with industry requests to give an amortization measure the right-of-way, may go down on the national defense score card as the outstanding defense blunder of the year. Yet this is the same Administration which likes to depict itself as being always on its toes militarily speaking—the same Administration which in September 1939 viewed with alarm the ominous war clouds in Europe and declared the existence of a limited state of emergency.

But in this latest classic example of official hemming and hawing, the New Deal at least is being consistent with its past record of inconsistency. It continues to blow hot and cold. Even after seven long years—time enough to become a past master in the art of synchronization—its policies continue to roll along 180 degrees out of phase.

Ever since it embarked on the questionable policy of selling Army and Navy aircraft and guns to European combatants and extending other aid "short of war," it has adhered religiously to the doctrine that time is of the essence. But when industry finds itself in a tight spot, with such important considerations as the manner in which the cost of necessary plant facilities might be deducted from taxes in a highly unsettled state, the Administration prefers to ignore the time lag.

White House Delays Amortization Plan

EARLY last month President Roosevelt, members of the National Defense Advisory Commission, high Administration officials and members of Congress agreed on an amortization speed-up provision that was looked upon with a high degree of favor by business. After having given the White House everything it sought in the way of appropriations, Congress at that time was in a mood to get things done. By itself, the amortization problem is not a difficult hurdle for Congress. It would have been a comparatively easy job to whip a bill into shape for early action. Prompt action was virtually assured. But the Administration demurred.

The White House categorically insisted that any elimination of the profit limitations of the Vinson-Trammell Act should not be attempted without simultaneous enactment of an excess profits tax and that by the same token the amortization formula should go



• Administration's attitude on amortization may be year's outstanding defense blunder . . . Its insistence on tie with excess profits tax legislation hampers industrial expansion to meet nation's needs.

hand in hand with the excess profits tax or not at all.

To form such a combination was about as certain a way to defer action on the amortization plan as anyone could conjure up. Because of its inherent nature, an excess profits tax gives rise to insurmountable administrative problems and poses unlimited potentialities for unfair application. It's a job that can not be worked out overnight.

Ironically enough, the New Deal's argument for making the two issues inseparable does not hold water when viewed in the light of the existing emergency, to which it has given its unqualified recognition. Placing large defense orders immediately may mean at some given future date the difference between total defense and half defense; and it

has been said that incomplete defense may be worse than no defense. On the other hand, excess profits taxes will not be payable in any event until March 15, 1941, and no revenue loss can possibly result in the meantime while mature and deliberate consideration is given the highly complex subject of arriving at an equitable excess profits tax.

Under the circumstances, the bill up for consideration this week at joint hearings before House and Senate committees is undeniably a commendable piece of work. In arriving at the excess profits tax, alternate bases of actual profits on invested capital could be selected. For example, a corporation could take (1) the difference between profits in 1940 and the average profits in the period 1936 to 1939; or (2) the return on invested capital, computed on the base period.

Protection Against Excessive Tax Rate

THE device of allowing corporations at their own option to pay such a tax, according to tax experts, tends to afford protection against an excessive tax rate and at the same time gives some protection to those corporations whose earnings might still be low even though better than those in the period from 1936 to 1939. Likewise, it could be depended upon within reasonable limits to protect corporations whose earnings, while high in respect to invested capital, owe little to the defense program.

The measure, which would repeal the present profit limitation of 7 per cent on negotiated contracts and 8 per cent on other contracts under the amended Vinson-Trammell Act, provides for tax rates on excess earnings ranging from 25 to 40 per cent—rates recognized as severe because they would be over and above the average tax of 20.9 per cent already paid on the net earnings of corporations.



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EMULSIFYING
CUTTING OIL



PETROLEUM PRODUCTS FOR ALL INDUSTRIES

The amortization formula adopted by the bill would permit the cost of plant expansion for defense purposes to be charged off against company earnings within a five-year period, at the rate of 20 per cent a year. This stipulation, however, was further liberalized with the proviso that should the emergency end before the expiration of the five-year period, annual deductions could be proportionately greater.

Knudsen Gave Assurances On Law

Several weeks ago, even before Treasury Department and Congressional tax experts had whipped a tax bill into shape, William S. Knudsen, member of the defense commission in charge of production, took on the Herculean role of assuring prospective government contractors that Congress, given time, would produce an amortization law that in general would answer the specifications laid down by business groups.

These assurances were based on a common understanding manifested on both sides of the conference table that a great part of the facilities made necessary in the production of defense equipment will have

little or no useful life when the defense program is ended, that prospective investors and producers intrinsically are concerned with the recovery of their investment without running the risk of having such recovery classified as profit or taxable income, and that the prospect for such recovery if possible should be determined before and not after the investment is made.

Some Agreed To Go Ahead

The conferences were in a measure successful. Some companies agreed to go ahead with plant expansions. Others, recalling that Congress is unpredictable and that there is always difficulty in determining costs, believed the only safe way was to await definite action by Congress.

Administration publicists tried to gloss over the fact that the amortization question continues to be a serious stumbling block to the defense program. They passed along the word that "generally" companies are going ahead with plant expansion plans. Privately, however, some officials concede that companies generally are not going ahead with the addition of neces-

sary facilities to the extent that defense advisers had hoped. The crux, of course, is the lack of a Congressional mandate on the subject of amortization.

Secretary of the Treasury Morgenthau, who from time to time has been criticized as being reluctant to ease tax restrictions through Internal Revenue decisions under the exigencies of national defense, takes the view that "if they (members of Congress) tell me what they need to get the contracts signed I'll be glad to give it a friendly push."

Actually, Treasury Department decisions recently have reflected a disposition to interpret tax laws with greater liberalism. In one decision, the Bureau of Internal Revenue ruled that the use of inexperienced labor may be taken into consideration in determining the amount of depreciation allowable for the purposes of allocating such depreciation to the cost of performing a contract. Franchise taxes on the privilege of doing business as corporations in some states, and the loss on disposition of machinery and equipment made necessary by acquisition of special additional machinery are other items which can be included as costs, according to the decision.

Under a ruling issued last week, contractors affected by the Vinson-Trammell Act can include as a cost the interest paid on money borrowed for the acquisition of special facilities in connection with national defense contracts.



Washington

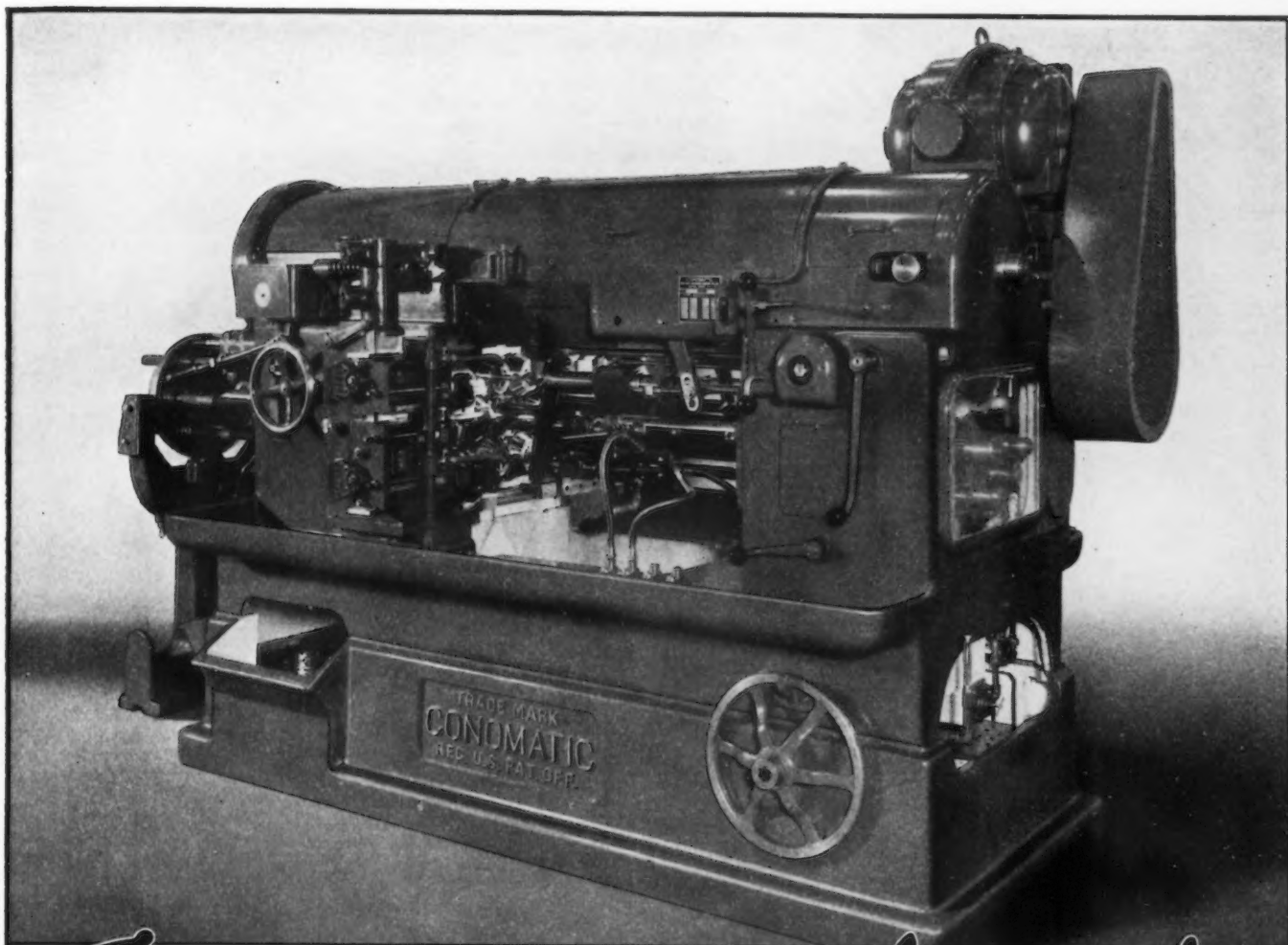
• • • The Development Corp., of Chile, a government agency, has placed a large order for agricultural machinery—tractors, plows, harrows, drills, binders, mowers, and other items—in the United States. According to dispatches from Santiago to the Commerce Department, the transaction will be financed through the Export Import Bank and involves a total expenditure of \$700,000.

It was represented as constituting the major part of a program of farm machinery purchases expected to amount to approximately \$1,200,000. The Development Corp., the report said, will arrange payments for farmers extending over a four-year period.

THE BULL OF THE WOODS

BY J. R. WILLIAMS

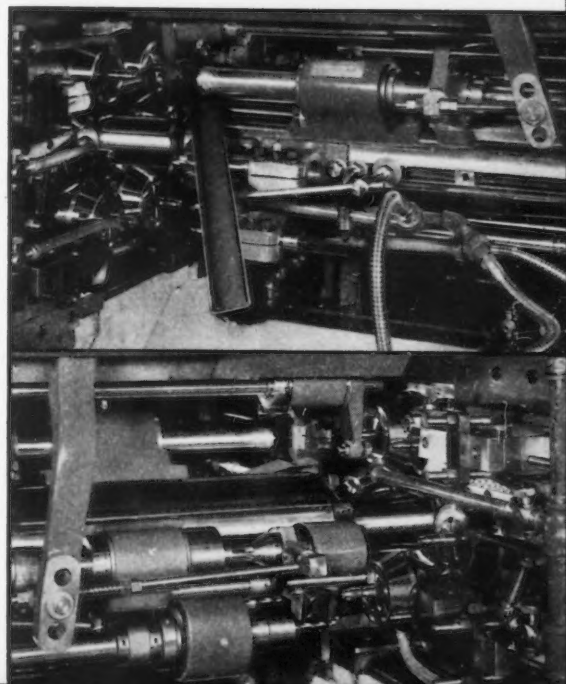




Time—10 seconds each!

IF it's performance you're after—if you're looking for accuracy at top speed—then look to the Conomatic. Here is a machine that is giving progressive manufacturers a full measure of satisfaction and profits. For example, take the parts produced on the 6-spindle Conomatic shown here. This part must be extremely accurate, yet requires wide forming cuts on a variety of diameters. In the fourth position a tapping attachment is used for threading an inside diameter $\frac{5}{16} \times 18''$ at the same time as a die is threading an outside diameter $\frac{5}{8} \times 27''$. Production—one part every 12.5 seconds at 80% production. If you want to increase your production and profits on complicated parts write to Cone—there is a Conomatic for every screw machine job.

CONE AUTOMATIC MACHINE CO.
WINDSOR, VERMONT, U. S. A.



Fatigue Cracks

BY A.H.DIX

Turndowns—Smiling and Scowling

••• Your favorite family journal, being the industry's pride and joy and having a highly responsive audience, receives about three times as many contributions as it can use. But despite the large number of contributions that must necessarily be returned, our editors refuse to use a printed rejection form, and ease the pain of rejection with a gentle, specially dictated letter.

The most abrupt rejection slip we have ever seen is one used by a Midwestern trade paper. It reads simply "We do not print this type of material." The kindest, coming to us via *Friendly Chats*, is:

••• We have read your manuscript with boundless delight. By the sacred ashes of our ancestors we swear that we have never dipped into a book of such overwhelming mastery. If we were to publish this book it would be impossible in the future to issue any book of a lower standard. As it is unthinkable that we shall ever find its equal, we are compelled to return this divine work.

—The Peiping Publishing Co.

Color in Black and White

••• In his report of a recent National Defense Advisory Commission press conference, Leon Wesley Moffett, your favorite family journal's Washington editor, refers to "George J. Mead, bespectacled, mild-mannered former vice-president . . .," and "William S. Knudsen answered questions for almost an hour in the heavy-carpeted governor's conference room."

We like the adjectives. They warm up the scene. But we won't be happy until we get something approaching *Time's* "slightly cockeyed, definitely pop-eyed, bulky, bluff Yakichiro Suma. . ."

Bureau of Standards, Please Note

A part weighing around 75 lb. frequently is taken down to 10 lb. Some parts must be brought down to absolute perfection without either plus or minus variation.—

THE IRON AGE,

Not even a teeny, weeny ten-millionth of an inch?

Stoppers

You wouldn't know the old face now!—*American Steel & Wire Co.*

You did move the World, Archimedes!—*Pratt & Whitney.*

Linotyper on the Loose

••• Nary a new bit of equipment or material that you might be able to use to advantage escapes the net spread by this journal's argus-eyed editors, which, of course, is no news to such a close reader and loving friend as yourself. We wouldn't even mention it if it weren't for the fact that the proof of a description of a new piece of laboratory equipment came through this way:

The chisel or flat drill was developed as a lavatory tool for the study of abnormal conditions.

Nymph Bats Out Two-Bagger

••• "It has always been a puzzle to me," postcards "The Constant Nymph" from Trenton, N. J., "that someone doesn't start a column and call it 'On Second Thought.'" That's the best suggestion yet. We will let it simmer awhile on the back of the stove and look at it again soon.

Automotive Note

••• This paragraph is in a letter that just came in from one of THE IRON AGE'S European editorial correspondents:

I went through France by motor car, through the occupied territory. France has suffered comparatively little, but the millions of fugitives which march still by road, rail, by motor cars or horses, in old buggies, by foot—millions and millions returning to their homes, depending only on help by the German military authorities—are a terrible sight. Petrol is, however, ample, so that all who had fled with their motor cars, can return with them.

Sorry

••• We bragged that this journal's subscription renewal percentage was 81.77. But we exaggerated. The auditor is here and finds we added up a column wrong. The right figure is 81.39 per cent.

We just got back from our two-weeks' vacation and find that another blurb was crowded out into the over-matter. It's too important—to us—to die there, so here it is:

Your favorite family journal ended up July with over 15,000 subscribers, which is a gain of more than 10 per cent for the 12 months. As far back as we care to check up, this is the sharpest climb in our history, and, except for a brief period, the more or less happy family of readers is largest in history.

Call for a Gross of Grover Whalens

The resulting dissemination of basic ideas that precede the assembly line probably will have a salutatory effect.

—From "On the Assembly Line"

••• We are all for it. They break a bottle of champagne over the prow of a new ship, amid much to-do, but new cars come off the line without benefit of a kind word or even a bottle of "coke."

The impression made on visitors is distinctly bad. After all the loving care lavished on a car during its embryonic stages, it is disillusioning to see it shunted off like a Dickens orphan when it is completed. We are all for having a salutorian at the end of each assembly line to say a few words of greeting over each new car and to aim at least a single baptismal shot of cleaning fluid at the radiator ornament.

Dual Personality

As is customary, I read the editorial in the Aug. 1 issue of our favorite family journal. Imagine my surprise when I found that the Editor was on vacation so the President was pinch-hitting. Shades of editorial ghost-writers!—or, in other words, when is an Editor not a President?

—P. C. Sowersby,

General Electric Co., Nela Park, Cleveland.

••• The editor of THE IRON AGE is the president, and vice versa. Both are John H. Van Deventer. When he writes as president he puts his coat on.

Puzzles

••• The answer to last week's trifle is 600. This timely headache is sent in by Thomas Abraham, of Arnold, Pa.:

A plane can travel 160 miles per hour in still air. On a day when the wind velocity is 40 miles per hour, the plane goes around a course which is 80 miles square. How long will it take the plane to go around the course, assuming that it can make a right angle turn without losing time and that it goes full speed when it starts. Direction of the wind is parallel to one of the sides of the course.

MONARCH'S 8-POINT PLATFORM *for* Forward Looking AMERICA



POINT 2 OF MONARCH'S PLATFORM

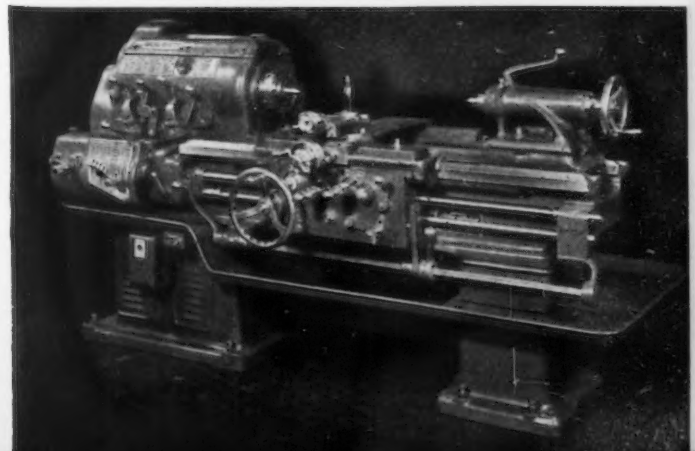
★ ★ ★ INDUSTRY SHOULD TRAIN YOUNG MEN

NO employment without experience . . . no experience without employment. That has been the sad state of American youth in many fields since the Great Depression. Whirling in a vicious circle . . . thrown bewildered into a struggle for security—easy prey for any "ism" that comes along.

Industry owes an obligation to itself and to society, to assume its share of the responsibility for guiding these young Americans along the way to a more useful life. Training must be provided in order that skilled hands can be developed for tomorrow's production requirements . . . so that a second generation of leaders will be ready to assume responsibility when the time comes.

Monarch provides for the development of its skilled workers by conducting specialized, voluntary training groups—which, over a period of time, mold another generation of master craftsmen. The Monarch Machine Tool Company, Sidney, Ohio.

Monarch's New 14" x 30" "AA" Lathe



MONARCH LATHES

News of Industry...

Germany Resuming Export Trading, Offering to Sell Overseas Via Spain

The German correspondent of THE IRON AGE, who is now in Lisbon, Portugal, confirms in the following communication that Germany is now offering steel for overseas shipment via Spain, states that business has been resumed between Germany and Spain and Portugal on a large scale, that the Belgo-Luxembourgian steel industry is virtually intact and is running again at almost full capacity, and that French steel works and iron mines have been incorporated into Germany.

Lisbon, Portugal

••• A question of probable interest to American steel companies is, can and will Germany resume selling overseas for her own and the Belgo-Luxembourgian steel industries through the medium of Spanish and Portuguese companies?

The possibility of such business now exists. On July 25 transit traffic from Germany to Spain via Irun-Hendaye was restarted by rail and road. Almost simultaneously a truck fleet of 50 to 55 5 to 8-ton trucks and a train of 60 to 65 rail wagons arrived from Germany at the Spanish frontier loaded with chemicals, medicines, machinery, etc., and export of Spanish products (cork, olive oil, minerals, metals, fruit, fish, conserves, etc.) was restarted to Germany.

At present Portugal is also included in the direct traffic. Transit freight rates are easily obtained and a coastal shipping service from Portuguese and Spanish ports to Bordeaux-Nantes is about to start. The Portuguese companies do not quote for Germany on any basis other than f.o.b. their own factories, as otherwise they would be included on the English blacklist, which would mean loss of business with England and possible reprisals elsewhere. The Spanish companies

sell and are willing to sell whatever they can.

The German Reichsbank has a large escudo deposit in Portugal as shipments before the outbreak of the war largely exceeded imports from Portugal. With Spain and

TAX-IDERMY!

Or Who's Going
To Do What
To "Who"

By E. B. TERHUNE

- Do you know that the interest on the Federal Debt alone now exceeds \$2,000 per minute, day and night?
- Or \$120,000 per hour,
- Or \$2,900,000 per day,
- Or \$1,050,000,000 per year?
- These huge and almost unbelievable figures represent interest only.
- In addition we have interest on State Debts, County Debts, Municipal Debts and a varied assortment of other debts of all styles, sizes, and combinations.
- The question is—Who's going to do what to who, and who's going to pay?
- I've never been a "wiz" at mathematics, and I'm frank to confess that I'm utterly confused when it comes to solving problems in modern Tax-idermy which, as I understand it, has to do with *skinning* the poor beast.

Mr. Terhune is president of *Boot and Shoe Recorder*.

Portugal there exists clearing agreements and trade agreements which still are in full force.

Large-scale business has been restarted. Offers of German motor cars, iron, steel, machinery, chemicals, etc., are now being investigated by importers at Lisbon.

Italy and Spain are now also connected with a direct line from Barcelona to Genoa and mutual goods exchange has been resumed.

Besides this expansion of German trade in Europe, the question is whether overseas trade will be resumed. The answer is in the affirmative, though all of the business that may be done will not be executed, as was the case in Italy, through native companies but through German companies. German steel works and exporters have their own representatives in Madrid, Lisbon and elsewhere, such as the Union Steel Export Co. (representing the United Steel Works); the Krupp Export Co., etc. The Belgo-Luxembourgian interests are represented by the Davum Export Co., which has branch offices in Spain and Portugal.

The Belgo-Luxembourgian iron and steel industry is intact. Industries in both countries are working again almost at full capacity as the works, with only two exceptions, were outside the fighting zone.

Both the German and Belgo-Luxembourgian interests are making offers via Spain for overseas shipment; in the first place to Latin-America, particularly Brazil, Venezuela and Columbia. Some business has resulted, though nothing can yet be disclosed as regards way of shipment, time and other particulars.

The French steel works and iron mines of Lorraine have already been incorporated into Germany. Of the iron and steel works, about 50 per cent are still idle, but one after another is going back to work and the German Steel Cartel expects that normal operations will be possible by the end of September at the latest. Prices of steel are more or less the same as United States export prices, which are being used as basis prices.

G-E, Johns-Manville Pays Employees At Camps

••• General Electric Co. has extended from two to three weeks the time in which the company will make up the difference in camp pay and normal wages for employees attending National Guard, Army and Navy Reserve Officers' Camps and Citizens' Military Training Camps. Approximately 1000 men will benefit from the ruling.

More than 110 Johns-Manville Co. employees in various plants and offices are taking three weeks' military or naval training in connection with the government's national defense program. The company will make up the difference in pay between what the government pays these men and what they would have earned if they had remained at work.

Cleveland Found in "Safe Zone" for Arms Manufacture

Cleveland

••• Cleveland has now been placed in the "A zone" for armament parts manufacture, according to Walter I. Beam, executive vice-president, Cleveland Chamber of Commerce, upon his return from Washington, Aug. 7. The personnel of the Army Ordnance office stationed here will be increased from 48 to 205 persons within three months.

Before being declared a "safe zone" for armament parts manufacture, Cleveland had been considered too near the Canadian border and given the same rating as Buffalo and Detroit.

Follansbee Steel Ready To Install Equipment

Pittsburgh

••• Construction work on the \$1,270,000 modernization program of Follansbee Steel Corp. preparatory to installation of equipment is nearing completion, John Follansbee, chairman, states. Revamping of the company's old open hearth building at Follansbee, W. Va., into a modern 63 by 1680-ft. brick, glass, and steel structure for housing two new cold reducing mills has been completed.

Exports of Railroad Equipment Advance

Washington

••• Exports of railway equipment during the first six months of 1940 amounted to approximately \$10,000,000, a figure greater than total yearly exports for three of the past five years, according to the Department of Commerce. While shipments for June, valued at \$1,304,047, were below the May and April 1940 figures of \$2,182,648 and \$2,792,213, respectively, and slightly under the March and February 1940 totals of \$1,594,678 and \$1,429,220, respectively, they were considerably more than June 1939 exports valued at \$860,468, the Department said.

Shipments of locomotives and parts, rolling stock and parts and miscellaneous equipment such as railway signals, car heating equipment and air brake equipment during the first six months of 1940 were valued at \$10,416,980 against \$3,809,744 in the corresponding period of 1939. Outstanding shipments during June included six steam passenger cars to Portugal, valued at \$277,741, and 150 freight cars, valued at \$328,937, to Brazil. Shipped to Mexico were 43 freight cars.

Manual on Arc Welding Published by Lincoln

••• "Lessons in Arc Welding," a 144-page book presenting, in a series of 51 lessons, the fundamental facts of welding, has been published by Lincoln Electric Co. The book is easily understood, is designed to enable a welder to utilize the welding process successfully and economically.

The 51 lessons are covered by four principal sections—welding with unshielded arc electrodes; welding with shielded arc electrodes; electrodes for particular joints and metals, hardfacing. Each subject is covered very thoroughly and line drawings and photographs are used generously.

Welding supervisors, foremen and instructors, as well as employees, will find practical information in this book. Copies are obtainable from Lincoln Electric Co., Cleveland, at 50c. a copy, postpaid.

Hot Dip Galvanizers Meet at Chicago Aug. 22

••• A. J. Blaeser, of Joslyn Mfg. & Supply Co., Chicago, will give the opening address Aug. 22 at the American Hot Dip Galvanizers Association's semi-annual meeting at the Palmer House, Chicago. Several papers on technical subjects relating to zinc coatings will be presented by association members and Wallace G. Imhoff, its technical director of research. The association's program includes a banquet for members and guests, Mr. Blaeser is president of the association. Stuart J. Swensson, 903 American Bank Building, is secretary.

Philippines Seeking Steel, Other U. S. Products

••• The Illinois Manufacturers Association reports that, because of the war, the Philippine Islands are seeking to buy in the U. S. items such as barbed wire, nails, bolts, nuts and other hardware, building material including masonite celotex and reinforcing steel bars, paint, plumbing fixtures, electrical equipment, galvanized iron, machinery parts and newsprint paper which was supplied by Germany and Canada.

Coming Meetings

Aug. 22—American Hot Dip Galvanizers Association, semi-annual meeting, Chicago.

Sept. 3 to 6—American Society of Mechanical Engineers, fall meeting, Spokane, Wash.

Sept. 18 to 20—National Industrial Advertisers Association, annual conference, Detroit.

Sept. 24 to 27—Association of Iron and Steel Engineers meeting and exhibition, Chicago.

Oct. 2 to 5—Electrochemical Society, Inc., fall meeting, Ottawa, Canada.

Oct. 14 to 16—American Gear Manufacturers Association, semi-annual meeting, Skytop, Pa.

Oct. 16—Porcelain Enamel Institute, fifth annual forum, Urbana, Ill.

Oct. 21 and 22—Associated Machine Tool Dealers of America, annual convention, Dayton, Ohio.

Oct. 21 to 25—National Metal Congress, Cleveland.

Oct. 31 to Nov. 2—Society of Automotive Engineers, national aircraft production meeting and exhibition, Los Angeles.

Tin Shortage Not Expected In United States

American producers of tin plate do not share the fears recently voiced in some circles that this country faces the possibility of a shortage of tin which might cause curtailment of tin plate consumption and force the use of substitutes, according to the American Iron and Steel Institute.

While no definite figures are available on aggregate stocks of tin held by members of the tin plate industry or in transit to them, leading producers are confident that the situation is comfortable. They foresee no important disturbing developments in the outlook.

That is the prevailing view despite recent events in the Far East which have cast a shadow over the future control of the Netherlands East Indies and French Indo-China. Both of these possessions have rich tin ore deposits and they supply the United States with a substantial part of its tin.

The opinion is common that, even if those colonial possessions were to pass out of the control of the empires to which they now belong, the new rulers would be no less eager to sell tin. It is one of the most valuable metals of the world and gives any country controlling supplies of it an important foreign trade asset. The United States as a great market for tin is not likely to be overlooked by those who have it to sell.

"Numerous suggestions have been made for possible ways by which the use of tin could be curtailed," says the institute. "One suggestion is for the use of a lighter coating of tin in the production of tin plate. Another is for the use of lacquer or enamel on black plate as a substitute for the coating of tin.

"Both of these methods are regarded by many can manufacturers as unsatisfactory for all purposes, particularly the packing of food. Full protection is essential for packed food, especially if it remains in the can for a considerable period before being con-

sumed. Such protection is uncertain with lighter coatings and is either impractical or too expensive with substitutes for tin.

"Meanwhile, with the government going ahead with its plan for purchasing 75,000 tons of tin for a national reserve and with tin plate producers more confident of their ability to maintain their own respective supplies, any fears of a shortage of tin do not appear to be well founded."

Rickard Co. Executive In G. O. P. Publicity Post

••• James R. White, president of Rickard & Co., specialists in industrial advertising, has been appointed director of business, trade and industrial publicity for the Eastern Division of the Republican National Committee. This is the first political campaign in which Mr. White has actively participated.

National Tube Co.'s New Sintering Plant Operating

Lorain, Ohio

••• The new \$400,000 sintering plant for reclaiming blast furnace flue dust has been placed in operation by National Tube Co. here. It is expected to operate double turn daily, as a large surplus of dust has accumulated since the old sintering outfit was abandoned several years ago. The new plant salvages ore dust.

Charter for Cargo of Steel Refused Japan

Washington

••• A charter for the shipment of a full cargo of "new steel" from an Atlantic port consigned to Mitsui & Co., of Japan, has been disapproved by the Maritime Commission. The charter had been sought for the S.S. LaFayette by the Waterman Steamship Corp. and called for shipment in September.

Maritime Commission officials would give no explanation for the action other than to say that under Section 9 of the Shipping Act of 1936 the commission is authorized to deny charters whenever such action is deemed to be necessary in the public interest.

Steel Imports From U. S. Ample, London Reports

Washington

••• The United States shipments of steel to Great Britain are described on a London report to the Commerce Department as "coming in well" and helping to compensate for the loss of supplies from Belgium. The report, written by the American commercial attache in London, quotes British authorities as believing that if all foreign ore sources now being used were stopped adequate supplies of finished steel could be obtained from the United States.

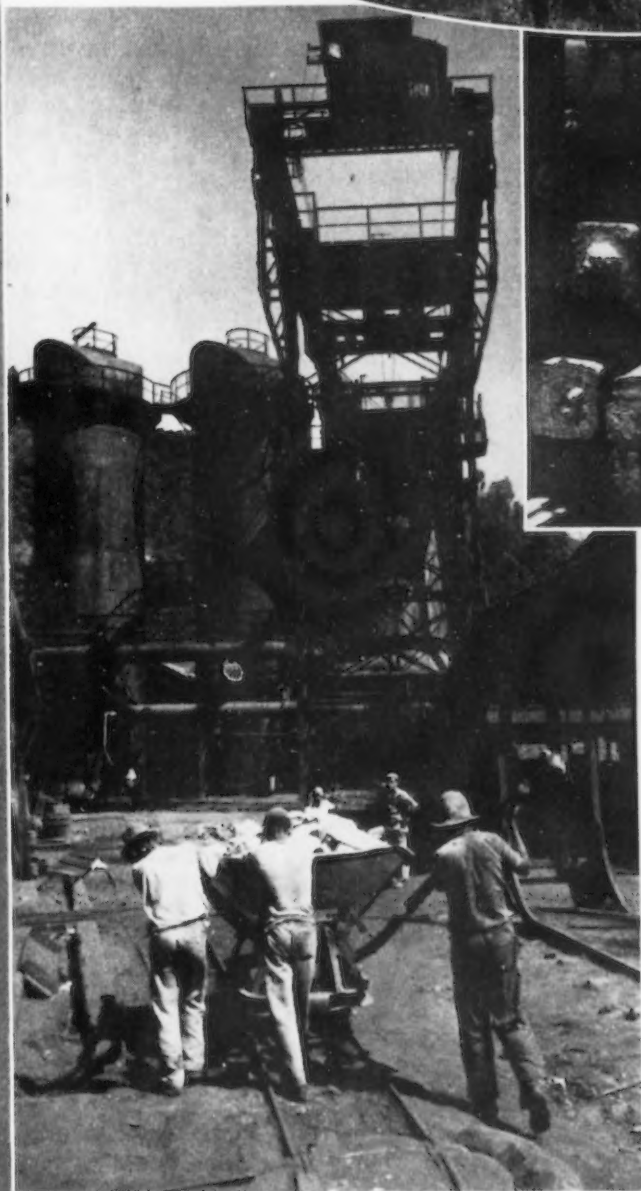
German successes in Europe have cut by one-half the normal iron ore imports of the United Kingdom, according to the report. Nevertheless, North Africa and Sierra Leone are still able to supply ore and British sources are described as "considerable." The report noted that to make 13,000,000 tons of steel in Great Britain in 1937, about 14,000,000 tons of ore came from domestic sources and 6,250,000 tons were imported. The crude steel equivalent of iron ore imported in 1937 was estimated at 3,000,000 tons.

Every steel plant in the United Kingdom is operating seven days a week, existing orders are being expedited, and the governmental system of steel allocation is working smoothly, the report said. As proof of the control's efficacy, the report cited the fact that commercial business is suffering severely.

AFL Calls Strike at Stolper Steel Products

Milwaukee

••• A strike involving about 200 workers has been called at the Stolper Steel Products Co., 3258 W. Fond du Lac Avenue, Milwaukee, by an AFL local. Picketing began over a deadlock on the matter of revision of a contract that demands an increase of 15c. an hour in wages and over elimination of the bonus system which the union officials claim does not work out equitably for all employees.



U. S. INDUSTRY, with much of the world at war, is giving more attention to South America as an outlet for its products. Shown here is the foundry of the Belgo-Mineira Siderurgical Co. in Sabara, state of Minas Geraes, Brazil. A Brazilian mission, now in the U. S., seeks funds to finance a steel plant which will utilize Brazilian ores.

(Hess from IRB Sandicite)

Amortization Uncertainty Holds Back New Armor Plate Plant

Washington

• • • Hearings before a joint Congressional committee on the pending tax bill developed the testimony from key defense experts last week that the government must attend to the legitimate needs of industry if maximum defense production is to be reached, that the construction of additional armor plate facilities has been delayed because of uncertainties over the question of amortization, and that it will take until mid-1944 before 2,000,000 men can be fully equipped under the present \$14,702,000,000 preparedness program.

Testifying on the pending tax measure, which includes a proposed excess profits tax in addition to a provision permitting industries to write off defense costs over a five-year period, Secretary of War Stimson said he had received no evidence that at any time has there been any tendency on the part of industry to hold back on negotiations with the Army.

Assistant Secretary of the Navy Compton urged that Congress repeal instead of suspend profit limitations, citing the case of one sub-contractor who, he said, was working on a \$10,000,000 naval gun contract but "absolutely refused to accept" orders under the existing restriction which limits profits to 8 per cent. The extent to which the uncertainty surrounding the amortization issue is a deterrent to the defense program was emphasized in other parts of the secretary's testimony.

He mentioned specifically one instance where he said construction of a new armor plate plant has been delayed for the past month because the manufacturer has been unwilling to proceed until he knows definitely what rate of amortization can be applied. An \$18,000,000 expansion program by an aircraft motor manufacturer was another instance cited by the witness to show the necessity for prompt action on the amortization problem.

It was William S. Knudsen, production expert on the National Defense Advisory Commission, who

estimated that it would be 1944 before the Army would be fully equipped under the defense program. Mr. Knudsen, however, subsequently withdrew the estimate and asked the committee to accept a brief on the subject at some later time. Expressing the view that "clear sailing" will be in store for the commission once the amortization question is settled, the General Motors executive said he indorsed the principle of the excess profits tax since the cost of rearmament "has to be paid."

Earlier in the week Mr. Knudsen joined his eight colleagues on the defense commission in a nation-wide broadcast designed to familiarize the country with the work of the agency. He estimated that of the money made available under the program since July 1, contracts have been awarded for 45 per cent of the Army funds and 75 per cent of the Navy funds. On

the delivery of combat material under the defense program, he forecast that the tooling-up process will take the remainder of this fall, that by January substantial deliveries of most of the material will begin, that by the spring of 1941 production should be going at a good rate.

While War and Navy Department officials agreed with members of the defense commission on the necessity for prompt action on the tax bill, there developed an issue last week on which they vigorously disagreed. That was the commission's release of a list of Army and Navy contracts which was represented as having been "cleared." On this list were several contracts which had not been signed by the War Department and one or two contracts which the departments preferred to keep confidential.

One in this category involved a \$5,689,725 contract being negotiated with the Baldwin Locomotive Works, Philadelphia, for "heavy tanks." Estimated to cost in the neighborhood of \$113,794 each, the 50 tanks will weigh between 70 and 80 tons, will be about 46 ft. in length and will mount 75 mm. guns. Their speed is estimated at 50 miles per hr.

Mr. Knudsen revealed earlier in the week that the designs for heavier tanks are being modified on the basis of European experience. He said that re-designing will be completed by the end of August and added that negotiations are under way with several companies for the production of tanks. A \$10,352,000 order for 627 light tanks recently was placed with the American Car & Foundry Co., Berwick, Pa., and the Rock Island (Ill.) Arsenal is known to be turning out an undisclosed number of medium-weight tanks.

The Reconstruction Finance Corp. was represented by Federal Loan Administrator Jones, as having agreed informally but definitely to provide between \$150,000,000 and \$200,000,000 for the construction of new aircraft plants. According to testimony by Mr. Jones before a Senate Banking and Currency Committee, about \$8,000,000,000 has been earmarked for the Packard Motor Co., for expanding its facilities for manufacturing the Rolls Royce aircraft engines.



Charles R. Miller, Jr., above, has been appointed director of purchases for United States Steel Corp. of Delaware, with headquarters at Pittsburgh.

U. K. Tops Japan As Scrap Buyer

• • • **British and Scottish steel mills** are now drawing so heavily upon the United States for their supplies of iron and steel scrap that the United Kingdom has displaced Japan as the leading foreign buyer of scrap, according to the Institute of Scrap Iron and Steel.

In the first half of 1940 exports to the United Kingdom have tripled, being 459,449 gross tons compared with 154,401 tons in the corresponding period of 1939. In addition, Canada also has actively entered the American market, taking 156,370 tons in the first six months, against 69,709 tons a year ago.

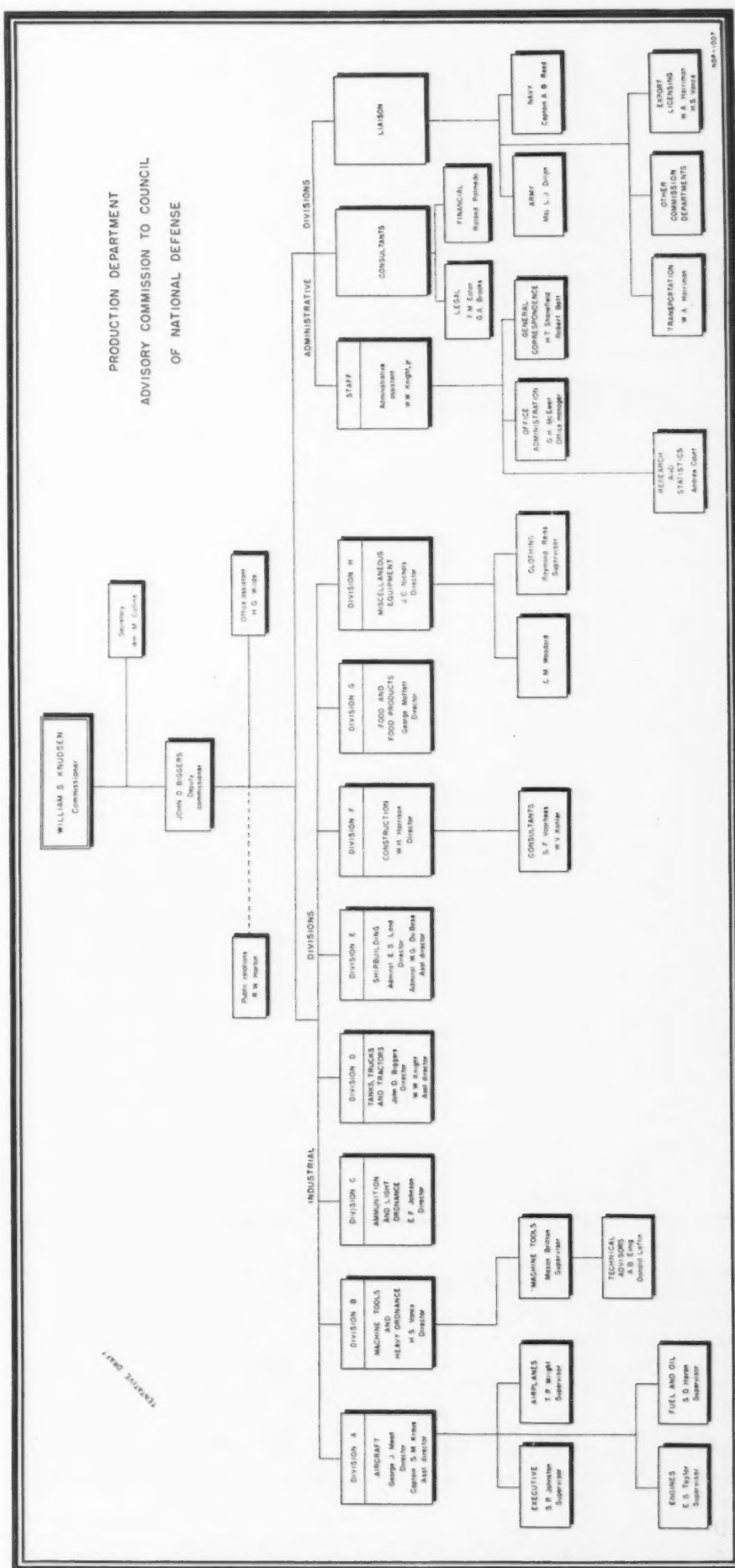
Meanwhile, the movement of scrap to Japan has declined to a point where the first half year total for 1940 was only 411,383 tons, less than half the 1,034,521 tons shipped a year ago.

While China is only a small buyer of American scrap, due to a dearth of steel works and foundries, nevertheless her purchases in the United States have increased 20 per cent this year.

Government statistics place exports of American scrap to all nations in the first half year at 1,469,543 tons, a decline of 19 per cent from a year ago. Domestic consumption, meanwhile, has totaled 18,256,000 tons or nearly 13 times exports.

• • • **Domestic consumption of iron and steel scrap in July, estimated at 3,526,000 gross tons by the Institute of Scrap Iron and Steel, practically equalled the 1940 monthly high of 3,581,000 tons set in January. In July, 1939, the melt was only 2,247,000 tons. Exports of scrap in 1940 have been averaging 244,923 gross tons per month, compared with 295,965 tons in 1939, and 247,864 tons in 1938.**

Outlined here is the organization of the production department of the Advisory Commission to the U. S. Council of National Defense under William S. Knudsen, commissioner.



"RACKS STILL IN SERVICE AFTER EIGHT MONTHS"

says this user
of

**UNICHROME*
RACK COATING-W**

Still they come—the enthusiastic reports from manufacturers and job platers alike, after using "Unichrome" Rack-Coating-W*. For example, one user writes:—

"The rack we had coated eight months ago is still in service in our Chromium Plating cycle. Your Rack Coating-W has been completely satisfactory".

The reason these "Unichrome" Rack Coating-W* users find this rack coating material so outstanding is its unequalled combination of advantages:—

1. Withstands boiling cleaners and all plating solutions
2. Tough—withstands wear and tear of handling
3. Contains no ingredients harmful to plating solutions
4. Cuts costs—reduces frequency of re-coatings
5. Easy to apply—"dip and force dry" method
6. Light in color—easy to see how well the rack is covered
7. Any part of rack can be recoated without recoating entire rack

Write for Bulletin No. 15
Containing Complete Information—

Platers without rack coating facilities may have their racks coated with "Unichrome" Rack-Coating-W* by Chromium Corporation of America, 4645 West Chicago Avenue, Chicago, Illinois; Belke Manufacturing Company, 947 North Cicero Avenue, Chicago, Illinois, or Lea Manufacturing Company of Waterbury, Connecticut.

UNITED CHROMIUM INCORPORATED

51 East 42nd Street, New York, N. Y.
2751 E. Jefferson Ave., Detroit, Mich.
Waterbury, Conn.

*Trade Mark
Reg. U. S. Pat. Off.



Government Contracts

• • • Federal contracts for iron and steel products, as reported for the week ended Aug. 3 by the Labor Department's Public Contracts Division, totaled \$9,473,764. For the same period, contracts aggregated \$1,441,400 for non-ferrous metals and alloys; and \$2,002,021 for machinery. Details for contracts above \$25,000 follow:

Iron and Steel Products

Maine Steel, Inc., South Portland, Maine, fittings, rope, \$38,844.
Hunter Steel Co., Pittsburgh, support towers, \$42,825.
Bethlehem Steel Co., San Francisco, reinforcing steel, \$44,454.
Bethlehem Steel Export Corp., Sparrows Point, Md., structural steel, \$135,771.
Budd Wheel Co., Detroit, shells, \$589,446.
Oneida, Ltd., Oneida, N. Y., tableware, \$39,500.
The Vollrath Co., Sheboygan, Wis., water pitchers, \$40,700.
Wm. Scrimgeour, Washington, D. C., tableware, \$32,750.
Crane Co., Chicago, steel valves, \$32,311.
Budd Wheel Co., Detroit, shells, \$206,568.
The John Van Range Co., Cincinnati, Ohio, kitchen equipment, \$45,160.
Budd Wheel Co., Detroit, shell, \$447,037.
Oneida, Ltd., Oneida, N. Y., tableware, \$38,847.
Norwalk Lock Co., South Norwalk, Conn., shot, \$125,998.
The Aetna-Standard Engineering Co., Youngstown, Ohio, gun carriages, \$3,302,139.
Koppers Co. (Bartlett Hayward Div.), Baltimore, gun carriages, \$3,725,930.
Jessop Steel Co., Washington, Pa., steel, \$27,445.
Bay State Tool & Machine Co., Springfield, Mass., parts for rifles, \$34,136.
Kilby Steel Co., Anniston, Ala., forgings for shell, \$113,228.
Line Material Co., Milwaukee, shell, \$104,432.
Burgess-Norton Mfg. Co., Geneva, Ill., bodies, \$37,632.
American Steel Foundries, Chicago, pins, \$26,280.
The Crosby Co., Buffalo, reels, \$55,682.

Non-Ferrous Metals and Alloys

C-O-Two Fire Equipment Co., Newark, N. J., fire extinguishers, \$118,978.
Revere Copper & Brass, Inc., Baltimore Div., Baltimore, brass strip, \$113,027.
Whitehead Metal Products Co., Inc., Philadelphia, nickel, \$53,520.
Aluminum Co. of America, Alcoa, Tenn., aluminum-alloy, \$50,844.
The International Nickel Co., Inc., New York City, nickel-copper alloy, \$135,942.
The American Brass Co., Waterbury, Conn., bullet jacket, cups, \$25,676.
Aluminum Products Co., La Grange, Ill., aluminum pots, \$90,200.
Federated Metals Div., American Smelting & Refining Co., Baltimore, zinc dust, \$42,400.
International Minerals & Metals Corp., New York City, zinc slab, \$44,927.
The New Jersey Zinc Sales Co., Inc., Palmerton, Pa., zinc, \$36,001.
Atlantic Zinc Works, Inc., Brooklyn, zinc, \$46,213.
The American Brass Co., Waterbury, Conn., cartridge discs, \$646,608.

Machinery

Austin-Hastings Co., Inc., Cambridge, Mass., turning lathe, \$60,000.
Emil Brown & Co., Los Angeles, kitchen and refrigerating equipment, \$53,947.
Harnischfeger Corp., Milwaukee, bridge cranes, \$41,960.
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y., cranes, \$175,400.
R. W. Kaltenbach Corp., Bedford, Ohio, gantry crane, \$95,600.
The Ellis Drier Co., Chicago, laundry equipment, \$52,847.
Federal Mfg. Co., Brooklyn, kitchen equipment, \$41,827.
Ingersoll-Rand Co., Washington, D. C., air compressor, \$32,880.
Henry G. Dupree, Jacksonville, Fla., power-plant equipment, \$267,604.
Worthington Pump & Machinery Corp., Harrison, N. J., pumps, \$59,760.
The Sebastian Lathe Co., Cincinnati, lathes, \$36,851.
C. F. Bulotti Machinery Co., San Francisco, twist drills, \$45,784.
Worthington Pump & Machinery Corp., Harrison, N. J., pumps, engines, \$38,089.
The Hobart Mfg. Co., Troy, Ohio, kitchen equipment, \$54,779.
Frick Co., Inc., Waynesboro, Pa., refrigerating plants, \$43,400.
Baldwin-Southwark Division, The Baldwin Locomotive Works, Philadelphia, hydraulic press, \$268,010.
Ingersoll-Rand Co., Painted Post, N. Y., air compressors, \$35,748.
The G. A. Gray Co., Cincinnati, planers, \$43,884.
Kearney & Trecker Corp., Milwaukee, milling machines, \$49,868.
The Monarch Machine Tool Co., Sidney, Ohio, lathes, \$36,012.
Brown & Sharpe Mfg. Co., Providence, milling machines, \$30,932.

STAMPINGS 1940 STYLE



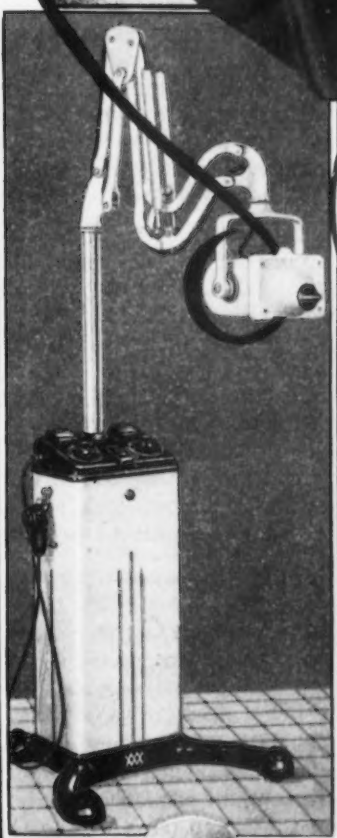
When Transue entered the deep drawn stamping field a few years ago, its executives realized that DESIGN was as necessary . . . in modern industry—as RELIABLE PRODUCTION.

So, Transue slowly and steadily became known not only as a source of supply for pressed steel but as a company ingenious in building streamline sales appeal into more attractive parts and products.

One of Transue's 1940 examples of ECONOMIC PRODUCTION plus DESIGN is the X-Ray unit illustrated here—a product which involved intricate handling because of its deep draw and flange—but which, in the dental laboratories, is a splendid example of a smartly styled pressed steel unit.

Write, wire or phone us if your engineering department wants specialized pressed steel design assistance without obligation.

For those manufacturers having their own press equipment, Transue will gladly quote on die requirements.



TRANSUE & WILLIAMS

ALLIANCE · OHIO

DESIGNERS AND MAKERS OF
DEEP DRAWN STAMPINGS

Sales Offices: NEW YORK · PHILADELPHIA · CHICAGO · DETROIT · INDIANAPOLIS · CLEVELAND

Warner & Swasey to Sell Stock to Public

Cleveland

••• Warner & Swasey Co. filed a registration statement Aug. 8 with the Securities and Exchange Commission covering 276,580 shares of its no-par common stock, which will be offered to the public through

underwriters, and an indeterminate amount which will be reserved for exchange for the company's 6 per cent cumulative preferred stock, \$100 par value, shortly after the public offering. Smith, Barney & Co. of New York are named as the principal underwriters. The company has been a privately owned enterprise since its formation 60 years ago. There are presently out-

standing 248,695 shares of \$5 par value common stock, which are largely owned by the Warner and Swasey interests or estates, relatives or heirs of the founders, and by officers, directors and employees. At a special meeting in Cleveland Aug. 20, stockholders will be asked to approve increasing the company's authorized common stock from 300,000 shares of \$5 par value to 1,000,000 no par shares, and changing each present \$5 par share into three new shares without par value.

Of the new stock to be offered publicly, 241,580 shares will be sold for the account of certain stockholders and 35,000 shares will be sold by the company itself. Figures contained in the registration statement indicate that after the proposed recapitalization and the public sale of stock as contemplated, substantial amounts of the new stock will remain in the hands of present large stockholders. Net cash proceeds to be received by the company will be added to its general funds.

Shortly after the public offering, according to the registration statement, the company will offer its preferred shareholders an undetermined number of its new common shares in exchange for their 6 per cent cumulative preferred stock, \$100 par value, now outstanding. The exchange offer will be based upon the public offering price of the new common stock and the par value of the present preferred shares.

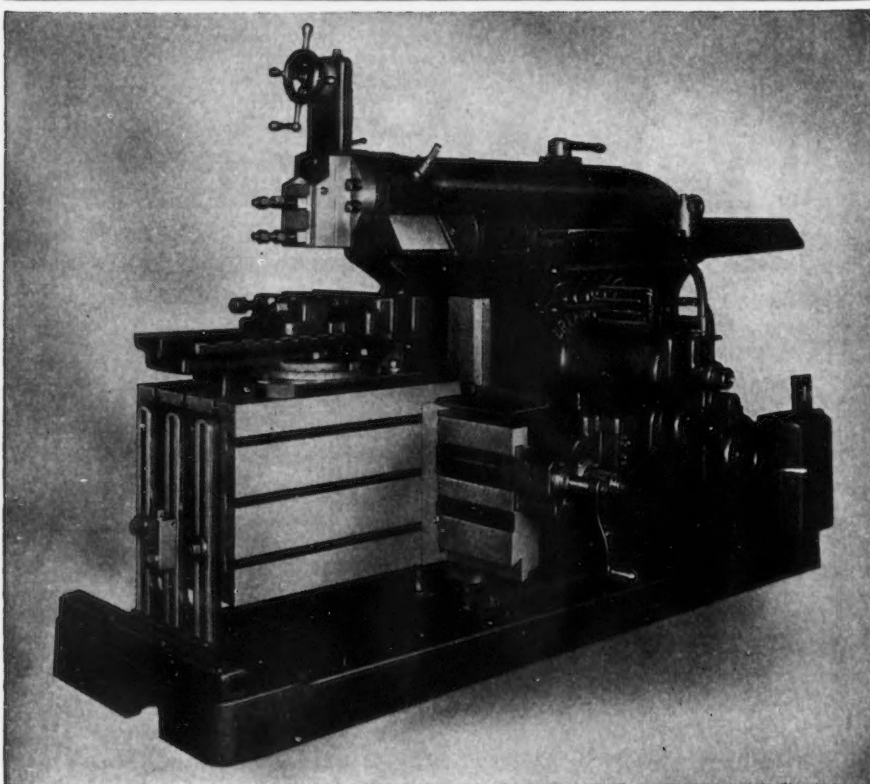
Pipe Line Service Corp. Plans Pittsburgh Plant

Pittsburgh

••• The Pipe Line Service Corp., Chicago, has completed negotiations for a plant site at Glenwillard, Pa., on the south bank of the Ohio River near here where it will soon start operations in pipe line processing.

Revamping of the building and preparation of the plant is to begin immediately and the Chicago firm has purchased nine acres and buildings at Glenwillard, formerly occupied by the General Cable Co. and abandoned 10 years ago. The company has another plant at Maywood, Ill., and specializes in the coating of line pipe prior to the laying of the line.

OHIO "Dreadnaught"



SHAPERS SINCE 1887

Built in sizes 16" to 36" inclusive. Capable of high production with tool room accuracy, Ohio Shapers have the necessary speed and power required by modern shops. Write for bulletin.

THE OHIO MACHINE TOOL CO.
KENTON, OHIO
MANUFACTURERS OF
SHAPERS, OHIO DREADNAUGHT, PLANERS
HORIZONTAL BORING, DRILLING and MILLING MACHINES

\$600,000 Expansion Planned By Buda Co.

Chicago

••• A \$600,000 expansion to the Harvey, Ill., plant of the Buda Co. is to be completed by Sept. 28. The new unit consists of 45,000 sq. ft. and will enable the company to more than double the present output of diesel tank engines.

Present facilities for building the light weight radial diesel engines are housed in a one story structure costing \$300,000 which was built last May. The new plant will adjoin the present shop and total plant space will be increased to 503,234 sq. ft.



Two new buildings for the Chevrolet Foundry in Saginaw, Mich., will be erected immediately. One will house the medical department and the other an addition to the service parts plant, according to Arnold Lenz, assistant manufacturing manager. The two buildings will add more than 100,000 sq. ft. to the plant buildings.

Foremen Convention to Hear Hook, Richberg

••• Charles R. Hook, president, American Rolling Mill Co. and Donald R. Richberg are among speakers who will address the 17th annual convention of the National Association of Foremen, at the Hotel Gibson, Cincinnati, Sept. 26 to 29. Hundreds of plant executives will attend the four-day sessions and the concurrent exposition of industrial equipment. In addition to meetings devoted to discussion of organization technique in foremen's clubs, the convention will examine problems confronting the foreman as the result of current defense activities, the responsibility of foreman to management and management to foreman, legal problems, job simplification, personnel problems and related subjects. President of the National Association of Foremen is A. C. Horrocks, Goodyear Tire & Rubber Company.

Indiana Steel Workers Average \$34.49 Weekly

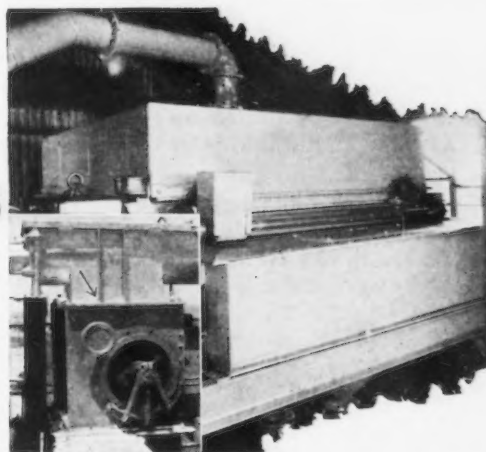
••• Average weekly pay of workers in Indiana steel mills in June was \$34.49, an increase of \$2.13 over May, according to the current issue of the Indiana Employment Review. Average hours worked per week was reported as 37.4, an increase of 2.5 hr. a week over May.

5000 Hear Concert by Carnegie-Illinois Band

••• With a background of open hearth furnaces and a ladle pouring steel into molds, the Carillo concert band and the Carnegie-Illinois male chorus recently entertained an audience of 5000 at the Purdue University Hall of Music in Lafayette, Ind.

Stearns MAGNETIC SEPARATORS

Help to Make
a Better Quality
Carbon Black



"All of the magnetic separators you have sold us (of which two are pictured) have done a very good job of removing a surprising quantity of magnetic and even faintly magnetic material that would otherwise contaminate our product ... in operation 24 hours a day ... handling large capacities ... remarkably free from breakdowns."

Technical
Director's
Letter
Tells the
Story*

You may not be making carbon black but you may have a similar problem of magnetic impurities in your product. Let STEARNS Magnetic help you. Make use of our extensive laboratory facilities. Our many years of experience in the profitable and practical application of magnetic equipment may be the means of producing a better product for you and effect considerable savings. Write for Bulletin 100.

* Name on application.

SEPARATORS — DRUMS — ROLLS
CLUTCHES — BRAKES — MAGNETS

STEARNS



MAGNETIC MFG. CO.

635 So. 28th Street, Milwaukee, Wis.

U. S. Renews Soviet Trade Agreement

Washington

• • • Containing a reservation that, because of uncertainties growing out of the war, purchase of \$40,000,000 worth of American goods during the next 12 months cannot be guaranteed, the United States trade agreement with Russia has been renewed for the fourth consecutive year.

Export restrictions on machine tools and other products had prompted reports that Russia would not promise as large an amount of purchases as in former years.

Machine tools constitute a large share of Russia's normal purchases in the United States and in 1938 were valued at \$26,161,558, in 1939 at \$15,414,268 and during the first six months of this year at \$995,814. United States exports of iron and steel products to

Russia amounted to 68,652 tons in 1938; 28,301 tons in 1939; and 4176 tons for the first six months of this year.

The American Manganese Producers Association was prompt to criticize the administration's action in renewing the trade agreement. J. Carson Adkerson, association president, complained that a 50 per cent reduction in the duty on manganese from Brazil was extended automatically to the original trade agreement with Russia.

Harvester-CIO Contract Covers Military Service

Chicago

• • • International Harvester Co. has signed a one year contract with the United Farm Equipment Workers of America, a CIO affiliate, providing for existing wages and working hours. A closed shop, which was demanded by the union, was not included in the terms of the contract.

Industrial Advertisers Conference Sept. 18-20

Detroit

• • • Industrial advertisers and marketing executives attending the 18th annual conference and exposition of the National Industrial Advertisers Association in Detroit, Sept. 18-20, will represent \$40,000,000 of purchasing power in the advertising field, Charles McDonough, Combustion Engineering Co., Inc., New York, N.I.A.A. president, estimates.

A greater attendance than heretofore is expected at the Detroit meeting when three days will be devoted to the broader aspects of industrial advertising. The Wednesday morning session and luncheon will be attended by administrative leaders in industry and the Friday morning session and luncheon will be devoted to aspects of general marketing problems. A series of clinics over the remainder of the conference, according to Lloyd R. Vivian, general conference chairman, will include such topics as:

1. Coordination of advertising with selling and how to win active cooperation from salesmen.
2. Measuring the readership of business papers.
3. Creation of effective copy, layout and illustration and how to test the relative effectiveness of your work.
4. Market information—how to get it and how to use it.
5. How can the advertising department contribute to solution of general company problems.
6. Prepare and present an advertising program that management will approve.
7. Allocation of budgets and how to organize your work.
8. Getting out into the field.
9. Increasing direct mail effectiveness.
10. Measuring advertising results.

Graver Tank & Mfg. Co. Forms New Division

• • • Graver Tank & Mfg. Co., Inc., East Chicago, Ind., has formed a division for the purpose of construction of equipment and other facilities for the petroleum industry. Lloyd K. Wells, construction engineer, for many years identified with erection of all kinds of refinery equipment and other facilities, is manager of this division.



SPRINGS

COIL SPRINGS
FLAT SPRINGS
SMALL STAMPINGS
WIRE FORMS
SNAP RINGS
LOCK SPRINGS
SPECIAL SPRINGS

from EVERY TYPE of Wire up to and including 1/2" diameter

A comparatively small organization, established 20 years ago and manned by men with years of practical experience. Equipment and plant facilities sufficient to handle your very largest orders, a personnel that assure individual attention to specific jobs as needed.

Many of our customers are concerns whom we have had the pleasure of serving continuously for the past fifteen years or longer.

SEND FOR QUOTATIONS
AMERICAN SPRING & MFG. CORP.
General Offices at HOLLY, MICHIGAN
Manufacturing Plants at Holly, Michigan and Belding, Michigan



McKAY

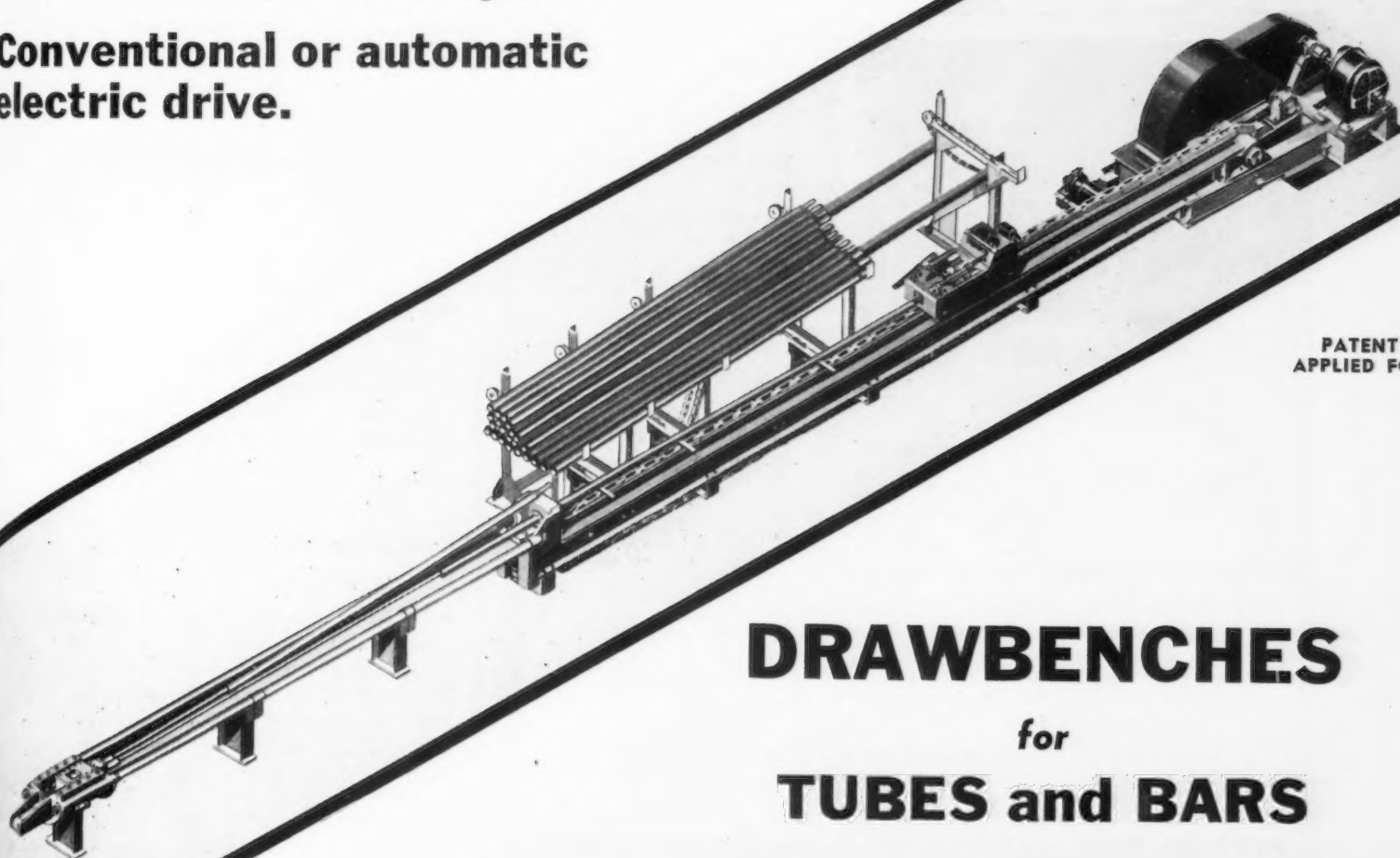
DRAWBENCHES

**Drawbenches for steel and
non-ferrous tubes.**

**Five sizes
10, 20, 35, 50,
100 thousand pounds
rated capacities.**

**Electric tube feed, twin mandrels,
and automatic draw cycle.**

**Conventional or automatic
electric drive.**



**PATENT
APPLIED FOR**

DRAWBENCHES

for

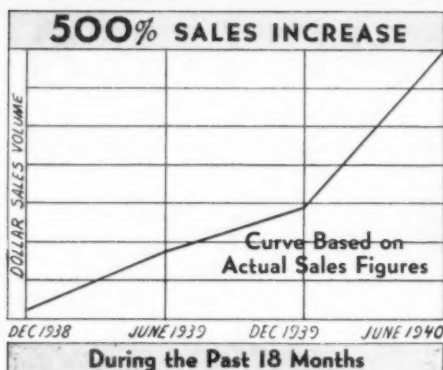
TUBES and BARS

THE McKAY MACHINE CO

**ENGINEERS AND MANUFACTURERS OF SHEET, TIN AND STRIP MILL EQUIPMENT
YOUNGSTOWN, OHIO**

NOT JUST ANOTHER CARBIDE

Phenomenal Sales Increase Proves Superiority
of KENNAMETAL for Machining Steel

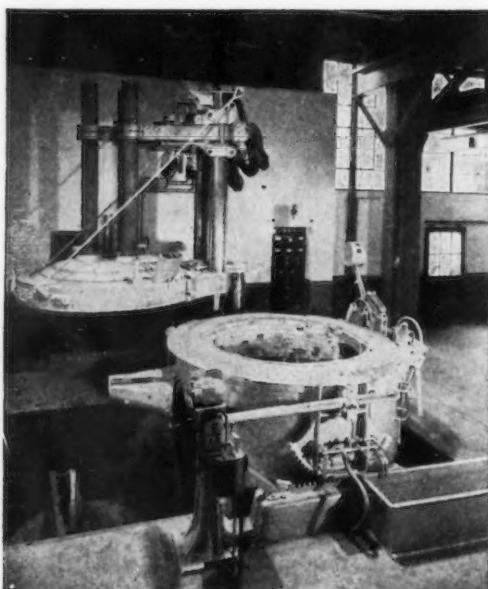


Sales of KENNAMETAL tools and blanks have increased 500% during the past 18 months—a feat that

would have been impossible except for the steady stream of repeat orders from satisfied customers. They have found that KENNAMETAL not only cuts production time far below previous standards, but also performs reliably over a long period of tool life.

It will pay you to find out whether or not your machine shop is now using KENNAMETAL tools for turning, boring, facing or milling steel parts. Send for a representative today—or write for free copy of Bulletin 740 explaining KENNAMETAL in detail.

McKENNA METALS Co.
144 LLOYD AVENUE
LATROBE, PENNSYLVANIA, U.S.A.



**USE
MOORE RAPID
LECTROMELT
FURNACES**

**for
MELTING
REFINING
SMELTING**

Illustration shows top charge type LECTROMELT furnace with roof raised and rotated to one side to permit quick charging with drop bottom bucket.

LECTROMELT furnaces offer the rapid and economic means for the production of plain carbon and alloy steel ingots and castings as well as gray and malleable irons. Top charge and door charge types are both available. LECTROMELT furnaces are built in standard capacities from 25 pounds to 100 tons. Write for details.

PITTSBURGH LECTROMELT FURNACE CORP.
Foot 32nd St. Pittsburgh, Pa.

Locomotive Building In India Postponed

Washington

• • • Because of difficulties in obtaining the necessary machinery and the uncertainty and expense involved in shipping, plans for the manufacture of locomotives in India are expected to be delayed until next year. According to information received by the Commerce Department, however, preliminary work on the Kanchrapara Workshop and locomotive designs are being pushed. Under arrangements made by the Railway Board with the Tata Iron and Steel Co., calling for the manufacture of axles, tires and wheels for all types of railroad coaches and locomotives, a start on production of these items is expected during the current year.

"And So To Sleep" Title of Wire Company's New Film

Cleveland

• • • Believed to be one of the first film subjects of its kind devoted to that universal pastime, sleep, the new sound slide film production, "And So To Sleep," has recently been made available for merchandising presentations to the bedding departments of furniture stores and retail department stores by the sponsor, the American Steel & Wire Co., subsidiary of the United States Steel Corp. The story concerns Mr. and Mrs. Neale, an average American couple, whose comfortless and unsatisfactory attempts to sleep are transformed into sound and restful slumber through the efforts of a kindly little imp, Mr. Premier Tag, representing Premier spring wire.

Bethlehem Stack Ready to Blow In

• • • Blast furnace B at the Bethlehem plant of Bethlehem Steel Co., a unit out of service since Feb. 2, will be ready for blowing in about the middle of August. The furnace has been completely rebuilt from the mantle up. Extensive use of welding has been a feature in the reconstruction, the entire shell, uptake and downcomers being of all-welded design. The rated daily capacity of the furnace is 600 tons.

Brassert Engineering Offices to Pittsburgh

••• H. A. Brassert & Co., consulting engineers for the steel industry, is moving its engineering offices from Chicago to Pittsburgh, and after Aug. 15 will be located in the First National Bank Building there.

The decision to move to Pittsburgh was prompted by the increasing concentration of steel company headquarters in Pittsburgh. The company's executive offices are in the Lincoln Building, 60 East 42nd Street, New York.

Porcelain Enamel Institute Annual forum To Be Oct. 16

Chicago

••• On Oct. 16 the fifth annual forum of the Porcelain-Enamel Institute will convene at the University of Illinois, Urbana, Ill. The program, which is not yet complete, will include discussions on the evolution of enameling iron, iron oxide in porcelain enamel, stretch testing of steel and a review of the institute's new test for the sagging of iron and steel sheets.

U. S. Steel Shipments In July 1,296,887 Tons

••• Shipments of finished steel products by subsidiary companies of United States Steel Corp. for July totaled 1,296,887 net tons. The July shipments compare with 1,209,684 net tons in June, an increase of 87,203 net tons, and with 745,364 net tons in July, 1939, an increase of 551,523 net tons.

For the year 1940 to date, shipments were 7,585,285 net tons compared with 5,583,768 net tons in the comparable period of 1939, an increase of 2,001,517 net tons.

Ohio Plant Gets Orders For 102 Light Planes in July

Alliance, Ohio

••• Taylorcraft Aviation Corp. received orders for 102 light airplanes valued at \$144,819 in July, the best month in the corporation's history, according to announcement by the company. This compares with 38 planes delivered in July, 1939, and 82 ships delivered in June, 1940.

4 Features YOU'LL LIKE IN CONTINENTAL

GALVANIZED SHEETS

- ★ **SOFT-ANNEALED**
- ★ **SUPERIOR COATED**
- ★ **FLAT AND LEVEL**
- ★ **PRIME QUALITY**

Continental Galvanized sheets are available in special analysis and copper-steel base, also in special coatings for special requirements.

CONTINENTAL STEEL CORP., Kokomo, Indiana
Plants at Canton, Kokomo, and Indianapolis



Bolts • Service & Packaging

are
the reasons for
specifying

CLARK BROS. BOLTS

instead of just "A" Bolt.

You will save money.



CLARK BROS. BOLT CO.
MILLDALE, CONN.

Defense Commission Watching Raw Materials Prices, Including Scrap

Washington

••• **Leon Henderson**, who heads the National Defense Advisory Commission's division of price stabilization, said this week that the commission is doing everything it can short of outright price control to keep the prices of raw materials used by the steel industry from rising unduly.

Without singling out raw materials necessary for steel production as requiring more vigilance on price trends than any other raw materials, Mr. Henderson, who is also a member of the Securities and Exchange Commission, told *THE IRON AGE* that his division regards the export licensing restriction on No. 1 heavy melting scrap as a factor in guarding against price rises. It is his opinion that there is "a strong possibility" that other grades of

scrap ultimately will be subjected to the export restriction.

Mr. Henderson, former secretary of the Temporary National Economic Committee and active participant in the TNEC steel inquiry last November, said that the work of the commission in keeping under constant surveillance the domestic price structure is based on a determination to avoid what he calls "the familiar price spiral." He recalled that Bernard M. Baruch, chairman of the War Industries Board during the World War, estimated that the last war cost this country at least \$13,000,000,000 more than it should if prices had been stabilized.

Without indicating any concern over the possibility of a rise in scrap prices, Mr. Henderson asserted that, should any unjustified price increase occur, his division

was prepared to go further than recommending the inclusion of other grades of scrap under the export licensing system.

This may take the form of a program to stimulate the collection of scrap, it was said, in which case the government would attempt to build up supplies "in the nature of a stockpile" presumably to guard against any future possibility of an artificial scarcity.

The former TNEC secretary is known to belong to that school of thought in Washington which believes that steel prices exercise a strong influence on other commodity prices and that one way to safeguard the general price level from rising is to maintain the existing level of steel prices.

"The domestic price structure is under constant surveillance," Mr. Henderson said. "When price increases appear unjustified conferences have been held and will continue to be arranged. Voluntary agreement is sought in this connection, and thus far business has evidenced its cooperation."

Here is how Mr. Henderson explained the functioning of his division when paper and pulp prices showed recent signs of "getting out of line."

"We consulted with experts on the staff of Edward R. Stettinius, head of the commission's division of industrial materials, which tries to keep accurate records necessary for insuring adequate supply. We looked into prices, exports, imports, found out how much capacity was still idle and concluded prices were rising mainly because of excitement and ignorance."

Other steps being taken by Mr. Henderson's division include the drafting of contract forms, particularly those covering contracts negotiated on a cost-plus-fixed-fee basis; working on arrangements designed to give the Army and Navy preference in getting supplies without bidding up prices and creating shortages; and watching for monopolistic practices.

"There is no need for government price fixing at present and none will be needed for any commodity if supplies are kept adequate, and if new facilities are built when needed," Mr. Henderson said.



ANY METAL • ANY PERFORATION

Industrial—Well balanced screens of excellent material and workmanship to assure maximum screen production combined with durability.

Ornamental—Approved patterns and finishes including many exclusive and characteristic designs for grilles and furniture. We invite your inquiries.

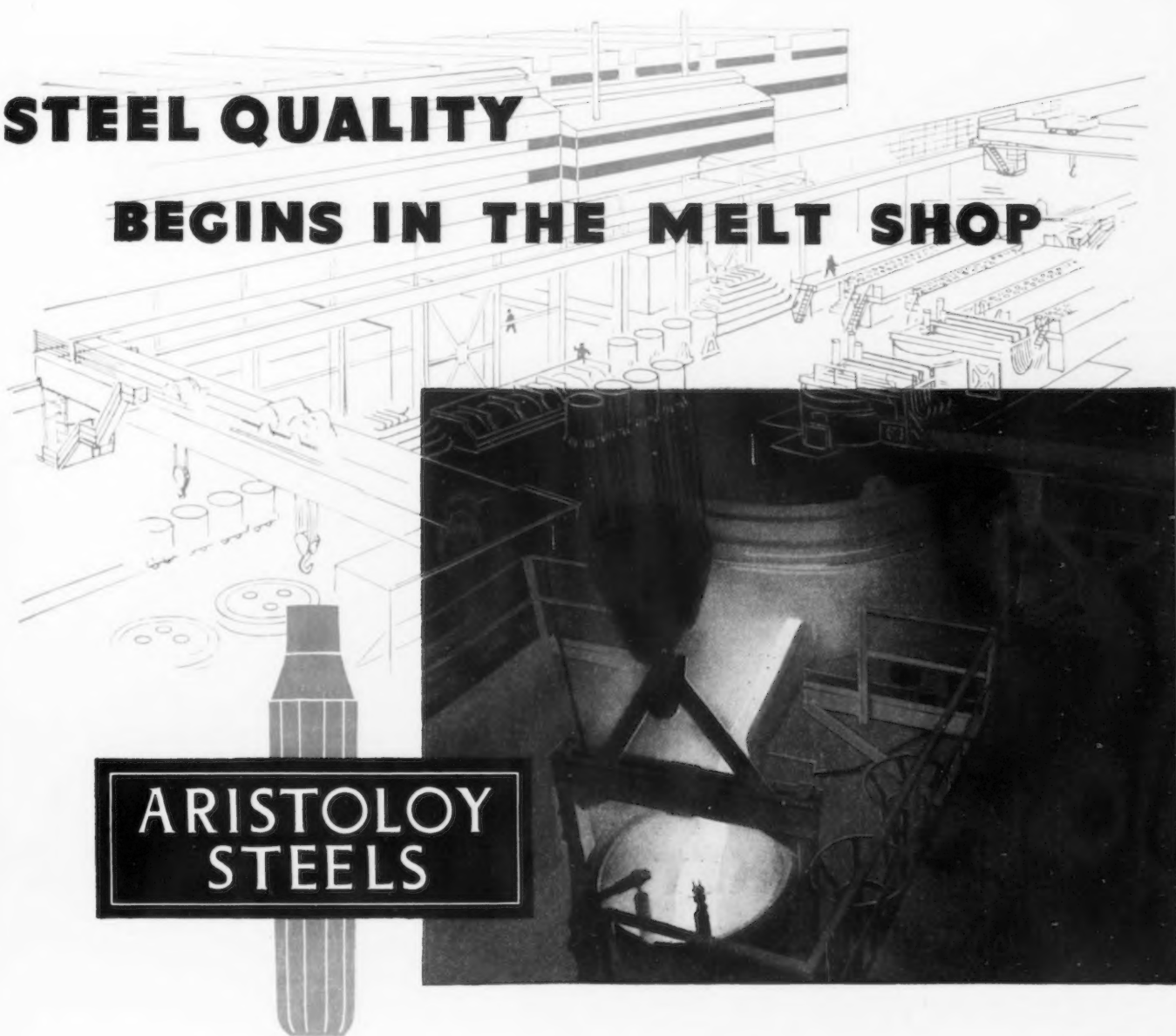
The
Harrington & King
PERFORATING CO.

5657 FILLMORE STREET—CHICAGO, ILL.

New York Office, 114 Liberty Street

STEEL QUALITY

BEGINS IN THE MELT SHOP



ARISTOLOY STEELS

The "Aristoloy" melt shop is equipped with top-charged electric furnaces of the latest design. Selected scrap is segregated in bins in the adjacent stock house and loaded into large charging buckets, handled by a transfer car and crane. Complete charging is accomplished in less than 15 minutes.

Relatively small furnaces simplify the accurate and uniform control of all phases of melting. These furnaces are equipped with the largest transformers (in rated capacity) which have so far been used on this type of furnace. High transformer capacity results in a very rapid melting of the charge. By thus saving time in charging and melting, a longer time is available for the all-important refining period.

"Aristoloy" steel quality begins in the modern "Aristoloy" melt shop.



COPPERWELD STEEL CO.

Warren, Ohio

ARISTOLOY S.A.E. ALLOY BILLETS AND BARS; OXIDATION AND CORROSION
RESISTING STEELS; TOOL AND SPECIAL STEELS; AIRCRAFT QUALITY STEELS; STAINLESS STEELS

Strikers Not Entitled to Unemployment Benefits

Birmingham

• • • The Alabama Court of Appeals on Aug. 2 held in a decision affecting several thousand coal miners of the Tennessee Coal, Iron & Railroad Co., who are affiliated with the United Mine Workers of America, that "the legislature, in our opinion, never intended for a member of a union to draw unemployment benefits, while his bargaining agents are discussing the terms of a proposed contract, where the union itself has ordered work to cease until the terms are met. . . ."

The Appellate Court, whose decision still is subject to review by the seven-member Alabama Supreme Court, reversed a Birmingham Circuit Court decision that A. R. Pesnell, one of the miners, was entitled to benefits from March 31 to May 19, 1939. The miners were idle while the United

Mine Workers of America were negotiating a new contract for the Appalachian area, on which wages, hours and working conditions of other regions are based.

Wisconsin Firm Reports Gain in Stainless Sales

Waukesha, Wis.

• • • Increasing use of fabricated stainless steel fittings has tripled sales for the Alloy Products Co., Walter Wachowitz, president, says more than 60,000 units have been sold since they were introduced a year ago after seven years of research in dairy applications to improve sanitation and remove chances for contamination from bacteria harbored by blowholes and pits. The company is branching into manufacture of tanks, vats, coils, coolers, pasteurizers and other special equipment for the dairy, food and chemical industries.

Industrial Machinery Exports Shade Lower

• • • United States exports of industrial machinery in June amounted to \$35,694,943, a slight decrease from the May total of \$36,682,663, the machinery division of the Department of Commerce reports. Shipments remained nearly 60 per cent above the corresponding 1939 total of \$22,573,175. Compared with the previous month, June exports of metal-working machinery, mining, well, and pumping machinery, and of "other industrial machinery" showed small declines.

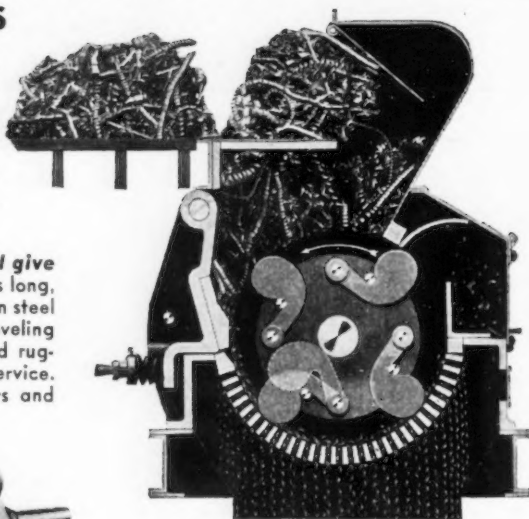
Export trade in power driven metal - working machinery amounted to \$18,564,300 in June, a three per cent decrease from the May figure of \$19,142,255 and a 13 per cent decrease from April's record figure of \$21,281,332. Shipments of lathes amounted to \$3,869,946, against \$4,038,325 in May; exports of milling machines totaled \$1,806,782 in June, compared with \$2,315,698 in May; grinder shipments were valued at \$2,344,396, as against \$3,321,142 in May. Increases, compared with the previous month, were recorded for drilling machines, which rose to \$1,176,998 in June from the May figure of \$932,470, and for rolling mill machinery, valued at \$2,884,832 in June, compared with \$914,454 in May.

Exports of metal-working machinery, other than power driven, amounted to \$596,917 and showed a 12 per cent drop from the previous month's total of \$681,920.

A HIGHER MARKET PRICE For METAL TURNINGS

And that's not all . . . the consumer prefers a uniform size of crushed chips; more tonnage per car can be shipped; easier to shovel or can be handled automatically by conveyor or magnet; better for storing; can be deoiled more readily and more thoroughly.

The Jeffrey metal turnings crusher will give you a uniform product . . . converts long, tangled masses of alloy or high carbon steel and brass turnings into short or shoveling lengths. Six sizes of extra heavy and rugged construction for continuous service. Manganese steel breaker plate liners and steel side liners.



Cross-section view shows extra heavy construction and uniform size of product produced. Screen bars of high carbon steel rectangular cross-section riveted in sections and clamped in position. At left is the crusher rotor showing the 'Flex-teeth' maintained by centrifugal force in their outer or crushing position.

Send for engineering data.

THE JEFFREY MANUFACTURING COMPANY

925-99 North Fourth Street, Columbus, Ohio

New York
Boston
Buffalo
Philadelphia

Scranton
Pittsburgh
Huntington
Cleveland
Milwaukee

Cincinnati
Detroit
Chicago
St. Louis
Denver

Salt Lake City
Birmingham
Houston
Baltimore
Terre Haute

Youngstown Plants on Lookout for Fifth Column

Youngstown

• • • Possible fifth column activities in Youngstown district steel plants will be combatted by six non-commissioned officers of the Regular Army Reserve. The six have been named by Gabriel Minarovich, commander of the Regular Army Reserve Association, and asked to report any signs of subversive activities in the mills to officers of the association and also to Federal authorities. The names of the appointees are being kept secret even to members of the association.

Canada's Output Hits New Peaks

Toronto

••• Plants associated with the iron and steel industry in Canada are maintaining a production rate never before equaled in the history of the country and further expansion of output of a widely diversified nature is proceeding rapidly. Production of iron and steel and their products is from 75 to 100 per cent greater than that of a year ago with all the primary steel producers operating at capacity with their expanded facilities.

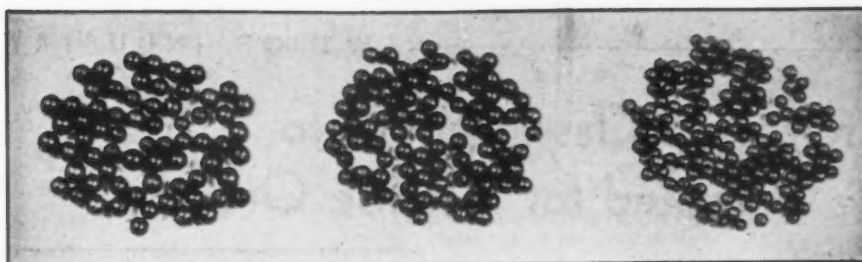
Despite the fact that Canadian mills are producing at the highest rate in history, industry in this country has been forced to draw heavily on the United States for iron and steel materials to augment our own production to meet the increased and widely diversified demand on war account.

Notwithstanding the increasing demand for iron and steel, Canadian producers have made no upward revision in prices since the outbreak of war with the exception of pig iron which was marked up \$3 per ton last September. Officials of steel companies state that unless absolutely necessary there will be no price advances and in their efforts to maintain this policy are refusing to raise bids for raw materials.

C. D. Howe, Minister of Munitions and Supply, Ottawa, announced that construction work involving \$10,000,000 for extension or creation of new plant facilities will begin immediately. He also stated that further plant construction to the extent of \$40,000,000 is now being planned by his department.

Use of Bachite for Can Making Reported

••• Use of the Bachite process (see THE IRON AGE, April 6, 1939, page 39) for manufacture of packers' cans in an effort to further this country's independence of foreign tin sources, was reported last week by Oscar B. Bach, New York, developer of the process. It was indicated that Great Atlantic & Pacific Tea Co. was experimenting with Bachite-processed sheets as a possible container for some of its products.



HEAT-TREATED STEEL SHOT

We manufacture shot and grit for endurance

A shot or grit that will blast fast with a clean finish.

This is the only reason why so many operators are daily changing to our shot and grit, from Maine to California.

The unprecedented demand for our—

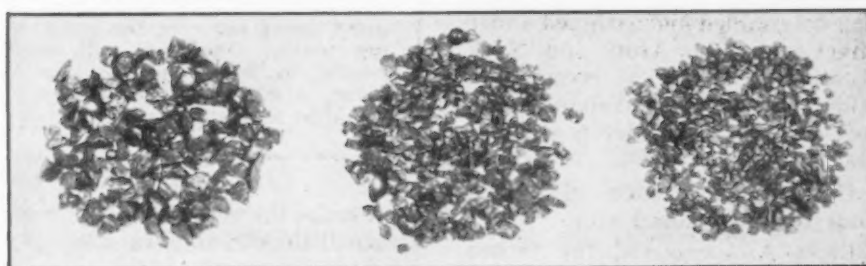
Heat-Treated Steel Shot and Heat-Treated Steel Grit

has enabled us to expand our production and maintain a quality that is more than satisfactory to our hundreds of customers all over the country.

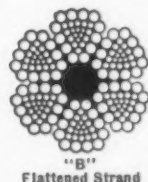
HARRISON ABRASIVE CORPORATION

MANCHESTER, NEW HAMPSHIRE

HEAT-TREATED STEEL GRIT



Style B
Flattened Strand



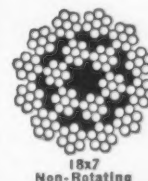
"B"
Flattened Strand



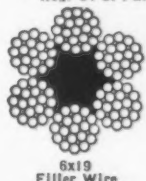
Wire Rope Center



Steel Clad



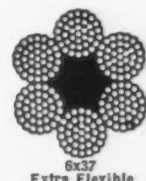
18x7
Non-Rotating



6x19
Filler Wire



6x19
Scale



6x37
Extra Flexible



8x19
Extra Flexible

You Can Depend On "HERCULES" (Red-Strand) Wire Rope...

There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

—PREFORMED—

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Preference Classifications to Be Adopted for Defense Orders

Washington

• • • A survey by the National Defense Advisory Commission showed this week that while there is no present need to invoke legal authority to enforce priorities on defense orders the priorities committee of the Army and Navy Munitions Board has been asked to establish rating of contracts by preference classifications.

"As far as may be considered necessary, each contract placed with private industry, or each order assigned to arsenals or navy yards, will bear a preference classification determined and assigned under direction of the Army and Navy Munitions Board," the commission said in a statement explaining the operation of the preference classification system.

General preference classifications to be employed are:

Class AA—reserved for future emergencies of exceptional nature; Class A—consisting of such Army and Navy orders as require preferred treatment. Each of these general classifications will in turn be sub-divided as far as may be necessary.

In addition to the preference classification, it was explained, each government contract or order will also carry a desired date. The delivery date is regarded as the primary consideration. A high preference rating does not mean that work on or delivery of orders bearing a lower classification or orders for private account or for export should be delayed, unless necessary to meet the delivery date on the order bearing a superior preference rating. As long as the delivery dates are met, details of adjustment will be left primarily to industry itself. It was explained that the Army and Navy and the defense commission will be ready to assist in such adjustment.

The commission emphasized, however, that there is little likelihood of shortages in most important materials and equipment used for the munitions program. It is expected that normally supplies will be obtainable through regular purchasing channels and that in

Britain Will Buy 4000 Tanks for \$200,000,000

Washington

• • • Great Britain is reported to be planning to spend \$200,000,000 in the United States for 4000 tanks of 25 to 30 tons each. Following a meeting of tank manufacturers and members of the National Advisory Defense Commission, it is revealed that the commission is negotiating with Chrysler Corp. to construct a \$16,000,000 tank factory according to a plan in which Chrysler will receive 4 per cent commission for building the plant and 4 per cent for building tanks. One year will be needed to build and tool the plant, after which production would be five tanks daily.

most cases the contractor will experience little difficulty in obtaining his requirements from sub-contractors and other suppliers.

In cases where supplies may prove to be somewhat less readily available, the commission believes that in many instances the contractor will himself be able to make

arrangements with his suppliers to fill orders on the scheduled date by calling attention to the preference rating on his contract together with the deadline to meet.

If a problem should become acute—a condition which all agencies connected with the defense program are trying to prevent—and the contractor becomes convinced that supplies will not flow to him at the required time, he should refer the case to the Army and Navy Munitions Board either directly or through the government inspector. In cases where the munitions board is unable to adjust the problem, it will be immediately referred to Donald M. Nelson, coordinator of defense purchases.

Although the President was given discretionary power by Congress recently to give Army and Navy contracts priority over all other deliveries, the commission has gone on record in favor of continuing the voluntary system until "it appears that more authoritative measures are required." Continuance of the voluntary system, the commission points out, "depends on complete voluntary cooperation of government and industry to assure completion of contracts on specified delivery dates and in accordance with the order of importance established by the strategic needs of the Army and Navy."



HARRY H. LUMLEY, left, manager of operations in the Duluth district of American Steel & Wire Co., has been appointed assistant manager of operations in the Chicago district, and B. E. PHENEGAR, right, general superintendent of the Cleveland Coke Works and Central Furnaces & Docks, has succeeded Mr. Lumley at Duluth.

War Department

Contracts

Washington

••• The War Department last week announced the award of contracts as follows:

The Leece-Neville Co., Cleveland airplane parts, \$217,420.

Republic Aviation Corp., Farmingdale, L. I., N. Y., airplane parts, \$114,636.

American Brass Co., Waterbury, Conn., metal for carriage cases, \$60,424.

Stewart-Warner Corp., Chicago, ammunition parts, \$865,359.

For ammunition parts—Doehler Die Casting Co., Pottstown, Pa., \$141,946; Pollak Mfg. Co., Arlington, N. J., \$955,350.

Stewart-Warner Corp., Chicago, \$506,001.

For artillery material parts—W. L. Maxson Corp., New York, \$106,589; Mergenthaler Linotype Co., Brooklyn, \$231,333; Bausch & Lomb Optical Co., Rochester, N. Y., \$53,890.

For military equipment—The Safety Car Heating and Lighting Co., Inc., New York, \$129,396 and Builders Iron Foundry, Providence, \$29,501.

For lathes—General Machinery Corp., Hamilton, Ohio, \$172,500.

For grinders—Brown & Sharpe Mfg. Co., Providence, \$28,117.

For machinery—Kearney & Trecker Corp., Milwaukee, \$37,450.

For machines—National Acme Co., Cleveland, \$35,272; Jones &

Lamson Machine Co., Springfield, Vt., \$28,835.

For small arms ammunition—American Brass Co., Waterbury, Conn., \$153,353.

Continental Motors Corp., Detroit, engines, \$1,090,894.

Chase Brass & Copper Co., Waterbury, Conn., ammunition parts, \$2,765,018.

Norris Stamping & Mfg. Co., Los Angeles, ammunition parts, \$356,166.

American Brass Co., Waterbury, Conn., ammunition parts, \$168,745.

Carnegie-Illinois Steel Corp., Philadelphia, rolled steel bars, \$65,400.

American Forge Division of the American Brake Shoe & Foundry Co., Chicago, forgings, \$62,400.

Budd Wheel Co., Detroit, ammunition parts, \$1,198,339.

Remington Arms Co., Inc., Bridgeport, Conn., ammunition parts, \$55,000.

Sperry Gyroscope Co., Brooklyn, equipment, \$594,103.

Struthers-Wells-Titusville Corp., Titusville, Pa., forgings, \$65,783.

Keuffel & Esser Co., New York, equipment, \$884,263.

Bausch & Lomb Optical Co., Rochester, N. Y., equipment, \$1,094,080.

W. & L. E. Curley Co., Troy, N. Y., equipment, \$255,312.

Wheland Co., Chattanooga, Tenn., guns, \$912,800.

Timken-Detroit Axle Co., Detroit, parts for artillery carriages, \$779,710.

The Firestone Tire & Rubber Co., Akron, Ohio, rubber blocks, \$112,128.

Revere Copper and Brass, Inc., Baltimore, ammunition parts, \$855,233.

Western Cartridge Co., Easton Alton, Ill., ammunition, \$144,831.

Output Of 100,000 Tons of Mn Ore Planned

••• Construction of a \$1,000,000 plant at Butte, Mont., for the concentration of manganese ores on a large scale has been announced by Anaconda Copper Mining Co. The plant is expected to turn out 100,000 tons of manganese ore annually, containing 58 to 60 per cent Mn.

The Metals Reserve Corp., a Federal agency set up to acquire stock piles of strategic material, has awarded Anaconda a contract for 80,000 tons of concentrates per year. The importance of this endeavor to decrease the dependency of this country on foreign sources for its manganese ore requirements is indicated by the fact that imports of manganese ore in 1939 were 736,751 tons, while domestic production was only 31,360 tons. The highest domestic production, attained during the World War, was about 300,000 tons a year.

The concentrating process developed by Anaconda also recovers such silver, zinc and copper as may be contained in the manganese ore.

800 COMPANIES ANSWER CHICAGO TOOL AND DIE SURVEY

Chicago

A report on the supply of tool and die makers in the Chicago area was released last week by the Chicago Association of Commerce Committee on Education and reviewed and indorsed by the Council on Training of Defense Workers of Chicago.

Out of 2500 questionnaires sent out, 800 had been returned by July 31. Of these 136 companies indicated that they employ at least one tool and die maker. These 136 companies employ a total of 1706

tool and die makers, employment ranging from 1 to 251. Average age was figured at 41.8 years and 24 per cent of the 1706 men are over 50 years of age.

Of these companies 91 have regular plans for apprentice training. These are the larger companies and employ over 90 per cent of the total number of men. These plants with training programs employ an average of 18 tool and die makers as compared with only 3 tool and die makers in plants with no training schedule.

The total number of apprentices at the present time is 356. The ratio of trainees to tool and die makers is roughly one to five, therefore. These companies, however, expect to have 438 trainees six months from now.

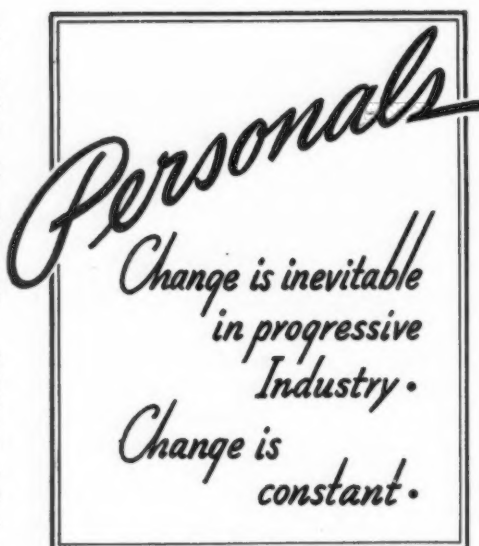
From a study of the reserve tool and die makers available, it was concluded in the report that the Chicago tool and die industry could not handle an increase in business of more than a few per cent because of a lack of trained men.

• **J. D. A. Morrow** has resigned, effective Aug. 31, as president of Pittsburgh Coal Co., Pittsburgh, which he has headed for the past 13 years. He plans to assume the presidency of the Joy Mfg. Co., Franklin, Pa., manufacturer of mobile coal loading machines, and will continue to serve as a member of the board of directors and executive committee of Pittsburgh Coal.

Mr. Morrow was one of the founders of the Joy Mfg. Co. and has been a member of its board of directors for many years. When he joined the Pittsburgh Coal Co. in 1926 as sales vice-president he was sales manager of the Franklin firm. He will succeed **W. E. Barrow** as president, Mr. Barrow having been made chairman of the board.

• **O. W. Baldwin** has been appointed assistant chief chemist of the Gary works by the Carnegie-Illinois Steel Corp. He was first employed at Gary works as a blast furnace iron chemist in the chemical laboratory in 1925 and served there in various capacities until the present time. Mr. Baldwin was turn foreman at the time of his appointment.

J. N. Quinlan has been made division superintendent of the West mills after serving as assistant division superintendent of these mills since 1938. He began as a stores clerk in 1907.



H. H. Bushong goes to Gary works as first assistant division superintendent of the West mills from McDonald mills, Youngstown, where he had been superintendent since 1935. Before his recent appointment, Mr. Bushong held various positions in the corporation's Youngstown district operations.

S. R. Stanier receives the post of second assistant division superintendent of the West mills. He first was identified with the Gary sheet and tin mills and, in 1936, was made assistant superintendent of the merchant mill. Mr. Stanier was superintendent of the merchant strip mills at the time of his present appointment.

• **M. J. Tennes, Jr.**, has been elected president of Shafer Bearing Corp., Chicago. Mr. Tennes has been vice-president and sales manager of the company for the past several years. At the same meeting of the directors, **A. H. Williams** was elected vice-president, and **Ray P. Tennes**, secretary and treasurer. Mr. Williams has been chief engineer, and Ray P. Tennes, assistant secretary and treasurer.

• **M. B. Sackheim**, vice-president since 1937 of Brown Fence & Wire Co., Cleveland, has been elected president to succeed **Charles R. Underhill**, who resigned July 1. **R. W. Taylor** has been elected vice-president and a director.

• **C. C. Kordenbrock**, formerly with Lodge & Shipley Machine Tool Co., has become associated with the Kordenbrock Machine Co., 2832 East Grand Boulevard, Detroit, as sales engineer.

• **H. O. Joynt**, president of the Traverse City Iron Works, Traverse City, Mich., has been elected president of the Traverse City State Bank.

• **Col. Fred Glover** has resigned as president and director of Reo Motor Car Co. No successor has been named. A formal statement attributed to Col. Glover explained that "inasmuch as reorganization plans were practically completed and the new manufacturing program was well underway" he rec-



O. W. BALDWIN, assistant chief chemist, Gary works, Carnegie-Illinois Steel Corp.



J. N. QUINLAN, division superintendent West mills, Carnegie company.



H. H. BUSHONG, first assistant division superintendent, West mills, Gary works.

ommended that his resignation be accepted. **W. C. Wood**, treasurer, has been elected vice-president.

- **Fred A. Prah** has been appointed manager of research, Weirton Steel Co., Weirton, W. Va. Mr. Prah formerly was connected with the Continental Can Co. and with the Owens-Illinois Can Co.

- **E. Q. Smith** has been elected vice-president and controller of Bundy Tubing Co., Detroit, and **Dr. R. H. Hobrock** has been elected vice-president in charge of production and research.

- **Arthur H. Rice**, of Washington, D. C., has been named assistant to the president of Williams Aircraft Corp., Toledo.

- **C. L. Forney**, formerly director of education for the International Harvester Co., has been named manager of the Jackson (Mich.) Manufacturers Association. Other new officers elected are **W. J. Corbett**, vice-president; **E. C. Hetherwick**, secretary; and **Thomas Harry**, treasurer. An apprenticeship plan, now in its initial organization stages, will be sponsored by the association under Forney.

- **William P. Laseter**, formerly assistant export manager of the Oil Well Supply Co., has been appointed export manager of the newly organized export division of John A. Roebling's Sons Co., Trenton, N. J. The new division is to be located at 19 Rector Street, New



WILLIAM P. LASETER, manager of the export division of John A. Roebling's Sons Co.

York. Mr. Laseter is a graduate of Georgia Military College and has been identified with Latin American export trade since 1921.

- **S. C. Merrill**, since 1936 Detroit district manager of sales for the Timken Roller Bearing Co., Canton, Ohio, has been appointed assistant general sales manager of the automotive division, with headquarters in the Fisher Building, Detroit. Mr. Merrill, who was graduated from Columbia University in 1917, joined the Timken company in 1922. For several years before

that he was connected with the Aluminum Co. of America.

- **Ralph J. Stayman** has been appointed manager of warehouse sales, Carnegie-Illinois Steel Corp., Pittsburgh. He formerly was manager of warehouses for Jones & Laughlin Steel Corp. and Joseph T. Ryerson & Sons, Inc.

- **Craig Hampton**, previously identified with the steel and tube division of Timken Roller Bearing Co., has been made superintendent of maintenance at the new plant at Warren, Ohio, of Copperweld Steel Co., Glassport, Pa.

- **Henry Ford** on July 30 celebrated his 77th anniversary by visiting the house in which he was born and then followed his usual daily schedule at the Dearborn Engineering Laboratories and his office.

- **Frank J. Rief**, purchasing agent, Chicago district, Carnegie-Illinois Steel Corp., will, effective Aug. 15, assume responsibilities of all purchases for the company. Mr. Rief will continue to have his offices in Chicago. He will be assisted in Pittsburgh by **R. L. Van Cleve** and in Chicago by **H. G. Elder**.

Mr. Rief has been connected with the company for 28 years, first at the South Chicago works and since 1916 in Chicago in the purchasing department. Mr. Van Cleve has been assistant purchasing agent, Pittsburgh district. Mr.



S. R. STANIER, second assistant division superintendent, West mills.



RALPH J. STAYMAN, manager of warehouse sales for Carnegie-Illinois Steel Corp.



FRANK J. RIEF, in charge of all purchasing for Carnegie-Illinois Steel Corp.

Elder has been assistant purchasing agent, Chicago district, under Mr. Rief.

• **A. Oakleigh Bush** has been appointed assistant chief sales engineer of the abrasive division of Norton Co., Worcester, Mass. Mr. Bush has been with the company for about 16 years, first in the electric furnace plant at Niagara Falls and then in the research and sales engineering departments at Worcester. In 1937 he was transferred to the Norton London office and later to the English plant at Welwyn, becoming its acting general manager in 1939. He returned to Worcester about a month ago with other American members of Norton company's European staff.

• **W. H. Milton, Jr.**, who has been sales manager for the General Electric Co. plastics sales department at Pittsfield, Mass., for the past two years, has been appointed assistant manager for all phases of the department's activities. He joined the company in 1920 as a student apprentice and became a member of the industrial department two years later.

• **Carl L. Westin**, assistant Northwestern district service manager in Chicago, for the Westinghouse Electric & Mfg. Co., has been appointed Southwestern district service manager with headquarters in St. Louis.

• **F. J. Geiger** has been appointed assistant manager of the electrical department of the Allis-Chalmers Mfg. Co., in which capacity he will be in complete charge of sales and engineering at the company's Norwood, Ohio, plant. He takes the position made vacant by the retirement of **C. J. Rattermann** after almost 40 years of service. Mr. Geiger joined Allis-Chalmers in 1913 at the New York district office. During the World War he served with the American air force in France and at the conclusion of hostilities he rejoined the firm. Other changes at the Norwood plant make **E. C. George**, who has been acting works manager and **A. Thorsen**, acting assistant works manager, officially appointed to those respective positions. **Frank R. Freyler**, of the Philadelphia office, has been transferred to Norwood to take over Mr. Geiger's former duties as assistant manager of sales.

Obituary

• **Charles H. Heller**, chairman of the board of the Bower Roller Bearing Co., Detroit, was buried in Dayton on July 30. In 1907 he aided in the organization of the Bower company, becoming secretary-treasurer. In 1923 he became president and general manager and in 1932 he was made chairman of the board. He was 65 years old.

• **William A. James**, veteran chief engineer of the Lackawanna plant of Bethlehem Steel Co., died at Chautauqua, N. Y., Aug. 2, of coronary thrombosis. Native of Wilkes-Barre, Pa., he was a Lehigh University graduate, was 69 years old and had been with the steel plant since 1901 when it was known as the Lackawanna Steel Co.

• **Charles D. Hastings**, pioneer in the automotive industry, was buried Aug. 9 at Detroit. He was nearly 82 years old. His record in the automobile industry included services with the Olds Motor Works, the Thomas-Detroit Automobile Co., which later was absorbed by the Chrysler Corp., and the Hupp Motor Car Corp. with which he was associated for 27 years. Mr. Hastings was born in Hillsdale, Mich., in 1858 and was educated in Detroit. He started business as a salesman. In 1903 he joined the Olds Motor Works in Detroit. When that firm moved to Lansing, he with Roy D. Chapin and Howard E. Coffin, went to the Thomas-Detroit Co. In 1908 Mr. Hastings became office manager of the Hupp Motor Car Corp. where he eventually became president and chairman of the board. He resigned in 1935, but in retirement retained his place as a director of the Murray Corp. of America.

• **Herbert W. Wolff**, 66 years old, senior vice-president of American Car & Foundry Corp., New York, died at his summer home near Grayling, Mich., on July 27. Mr. Wolff was associated originally with the Michigan Car Co. in Detroit and remained with that concern until some time after its consolidation with the Peninsular Car Co. of Detroit. When American

Car & Foundry Corp. was organized in 1889, he joined the firm as chief engineer and took charge of its shop in St. Louis. In 1916 Mr. Wolff was made vice-president and in 1925 he was elected to the board of directors.

• **Charles F. Schenck**, part owner of the Hess-Schenck Co., Cleveland machine tool dealer, and salesman for the Toledo General Mfg. Co. for the Eastern and Central United States, died in Cleveland, Aug. 1 at the age of 62.

• **U. Grant Eagleston**, former president of Eagleston-Parke, Inc., Norfolk, Va., iron and steel jobbers, died in that city on Aug. 5, after a long illness. He had been identified with the warehouse business for over 50 years.

• **Harry E. Field**, former vice-president of the old Jeffrey Automobile Co., Kenosha, Wis., and inventor of the sedan model, died in Pittsfield, Mass., where he was visiting relatives. It was while he was with Jeffrey that he developed the idea for building a sedan body to replace the old limousine type. He also had been vice-president of the Hartford Rubber and Lee Tire companies. He was 68 years old.

• **Christian Rasmussen**, Milwaukee plant engineer for the International Harvester Co., died suddenly from a heart attack at his home in West Allis, Wis., Aug. 1, aged 54 years. He had been general superintendent in charge of plant operations at the Milwaukee factory for many years. He was born in Denmark and was engaged in engineering work in Russia in 1912 when he joined the Harvester organization. He stayed in Moscow for six years and in 1918 went to Milwaukee to assume his late position. He made several trips to France and Russia later.

• **George McMurtrie Godley**, formerly vice-president of the Linde Air Products Co., 30 East 42nd Street, New York, died at Martha's Vineyard, Mass., on Aug. 10, aged 64 years. He retired about 12 years ago. After graduating from Massachusetts Institute of Technology in 1898 as a metallurgical engineer, Mr. Godley was in business for himself before joining the Linde company. He was also a former president of the Burden Iron Co., Troy, N. Y.

Steel Exports Advance to 617,678 Tons in June

Washington

••• Exports of iron and steel as compiled by the Commerce Department reached the record figure of the 617,678 gross tons (excluding scrap) for June, with exports for the first six months of this year—2,770,614 tons—representing a three-fold increase over exports during the comparable period last year. June exports, increasing 30 per cent over those for May when 471,481 tons were exported, represented an increase three times greater than those for June, 1939, when iron and steel exports amounted to 189,968 tons.

Slight losses were shown in the trade with South America and Africa but shipments to Europe, North and Central America and the West Indies and to the Far

Total for month triples shipments for like period in 1939

East increased in June. The trade with Europe, reflecting a marked rise in shipments to the United Kingdom, rose from 192,744 tons in May to 262,007 tons in June. Exports to North and Central America climbed to 119,420 tons from 80,812, while exports to the Far East totaled 112,609 tons against 69,338 tons.

Chief item exported in point of tonnage was non-alloy steel in-

gots — 206,403 tons — of which 178,641 tons went to the United Kingdom; 12,781 tons to Canada; and 10,291 tons to Japan. Following, but only fractionally as large, was the 48,852 ton trade in non-alloy black steel sheets with Canada taking 20,619 tons, France 8246 tons, and China 3023 tons.

Scrap exports, 318,369 gross tons valued at \$5,261,321, were slightly increased in June as compared with May when 312,483 tons valued at \$5,199,424 were shipped.

Included in the June, 1940, exports of scrap are 317,202 tons of iron and steel scrap including the 155,364 tons sent to the United Kingdom, the 56,776 tons dispatched to Japan.

IMPORTS

June		Six Months Ended June	
1940	1939	1940	1939
643	4,276	5,775	15,854
3,606	8,286	16,445	32,477
126	154	664	889
...	...	190	132
...	262	609	871
1	2,537	1,260	14,803
4,376	15,515	24,943	65,026
31	79	440	209
...
78	782	3,926	5,011
109	861	4,366	5,220
9	57	89	1,033
...
1	14	7	19
...
81	2,491	1,726	12,434
...	37	194	313
...
32	96	817	636
...	2,881	601	11,955
...
...	5,183	687	25,875
16	...	16	5
6	12	57	36
...
135	280	2,008	3,644
...	400	24,246	24,246
...
18	128	786	1,300
56	116	426	1,055
...	1,883	44	10,258
101	386	1,357	2,686
8	735	103	4,881
3	3	124	63
531	1,341	885	4,227
...	...	12	80
...	7	3	203
997	16,050	9,942	104,755
...	36	419	387
...	78	2	102
23	47	376	848
...
23	161	797	1,337
5,505	32,587	40,048	176,994

EXPORTS

June		Six Months Ended June	
1940	1939	1940	1939
30,915	7,689	130,936	27,933
777	2	10,097	38
...
3,087	293	5,857	677
...
318,369	398,888	1,481,105	1,788,952
353,148	406,872	1,627,995	1,817,600
206,403	8,402	620,120	49,164
9,525	252	18,208	6,608
11,290	1,009	31,421	4,637
28,036	3,564	103,184	10,603
255,254	13,227	772,933	710,012
51,091	20,698	243,359	135,762
14,302	8,246	88,672	46,185
509	164	3,568	1,545
154	63	982	433
50,865	26,820	228,029	132,356
125	285	1,349	687
107	4	236	40
42,506	14,478	282,890	71,914
1,362	43	8,360	311
3,006	1,045	14,105	7,394
33	5	529	193
...
14,345	4,979	88,042	33,658
93	46	500	261
50	58	264	442
3,105	1,119	6,870	2,935
26,836	10,030	107,604	41,669
9,123	3,311	38,721	16,554
34,074	26,104	267,677	100,884
2,546	4,763	14,194	13,561
11,203	3,590	53,661	21,828
11,578	5,757	100,038	35,677
1,647	853	11,474	3,739
13,608	5,374	71,084	25,528
721	1,314	5,630	6,205
4,194	5,288	19,337	22,263
6,741	...	36,591	...
736	2,614	3,384	11,763
1,675	719	7,916	3,995
6,036	10,719	68,901	41,493
...
1,513	799	10,341	3,418
313,884	159,188	1,784,408	782,693
7,609	5,048	36,133	17,307
306	344	2,439	1,801
3,587	1,152	15,995	7,818
633	471	3,203	1,963
1,626	2,554	8,613	12,033
13,761	9,569	66,383	40,922
936,047	588,856	4,251,719	2,712,227

¹ In imports the tonnage shown is the alloy content: the manganese, chromium and silicon content, as the case may be. ² Imports include skelp and saw plate. ³ Import figure includes iron slabs. ⁴ Imports include sashes and frames only.

*No separate figures.

The Iron Age Comparison of Prices

Advances Over Past Week in Heavy Type; Declines in Italics

	Aug. 13 1940	Aug. 6 1940	July 16 1940	Aug. 15 1939
Flat Rolled Steel: (Cents Per Lb.)				
Hot rolled sheets	2.10	2.10	2.10	2.00
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.00
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate	\$5.00	\$5.00	\$5.00	\$5.00
Manufacturing ternes ...	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.40
Rails: (Dollars Per Gross Ton)				
Heavy rails	\$40.00	\$40.00	\$40.00	\$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	\$34.00	\$34.00	\$34.00	\$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	1.92
Skelp (grv'd)	1.90	1.90	1.90	1.90
Pig Iron: (Per Gross Ton)				
No. 2 fdy., Philadelphia..	\$24.84	\$24.84	\$24.84	\$22.84
No. 2, Valley furnace....	33.00	23.00	23.00	21.00
No. 2, Southern Cin'ti....	23.06	23.06	23.06	21.06
No. 2, Birmingham.....	19.38	19.38	19.38	17.38
No. 2, foundry, Chicago†	23.00	23.00	23.00	21.00
Basic, del'd eastern Pa..	24.34	24.34	24.34	22.34
Basic, Valley furnace....	22.50	22.50	22.50	20.50
Malleable, Chicago† ...	23.00	23.00	23.00	21.00
Malleable, Valley	23.00	23.00	23.00	21.00
L. S. charcoal, Chicago..	30.34	30.34	30.34	28.34
Ferromanganese‡	120.00	120.00	120.00	80.00
†The switching charge for delivery to foundries in the Chicago district is 60c. per ton. ‡For carlots at seaboard.				
Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh..	\$18.50	\$18.25	\$19.00	\$16.25
Heavy melt'g steel, Phila.	19.50	19.00	18.75	16.25
Heavy melt'g steel, Ch'go	17.875	17.25	17.375	13.875
Carwheels, Chicago	18.25	18.25	19.00	12.75
Carwheels, Philadelphia..	21.25	20.75	20.75	16.25
No. 1 cast, Pittsburgh...	19.75	19.75	19.75	15.75
No. 1 cast, Philadelphia.	21.25	21.25	21.25	16.75
No. 1 cast, Ch'go (net ton)	16.75	16.75	16.75	12.75
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt...	\$4.75	\$4.25	\$4.25	\$3.75
Foundry coke, prompt...	5.25	5.25	5.25	4.75
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.*	11.00	11.50	11.50	10.50
Copper Lake, New York.	11.00	11.50	11.50	10.50
Tin (Straits), New York.	51.375	52.25	51.25	48.65
Zinc, East St. Louis....	6.25	6.25	6.25	4.75
Lead, St. Louis	4.60	4.85	4.85	4.90
Antimony (Asiatic), N.Y.	16.50	16.50	16.50	14.00
*Mine producers only.				

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 109 to 118 herein. On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Composite Prices . .

FINISHED STEEL				PIG IRON				SCRAP STEEL			
Aug. 13, 1940	2.261c.	a Lb.		\$22.61	a Gross	Ton.		\$18.63	a Gross	Ton.	
One week ago	2.261c.	a Lb.		\$22.61	a Gross	Ton.		\$18.17	a Gross	Ton.	
One month ago	2.261c.	a Lb.		\$22.61	a Gross	Ton.		\$18.38	a Gross	Ton.	
One year ago	2.236c.	a Lb.		\$20.61	a Gross	Ton.		\$15.46	a Gross	Ton.	
High		Low		High		Low		High		Low	
1940	2.261c., Jan. 2	2.211c., Apr. 16		\$22.61, Sept. 19	\$20.61, Sept. 12			\$19.92, June 18	\$16.04, Apr. 9		
1939	2.286c., Jan. 3	2.236c., May 16		23.25, June 21	19.61, July 6			22.50, Oct. 3	14.08, May 16		
1938	2.512c., May 17	2.211c., Oct. 18		23.25, Mar. 9	20.25, Feb. 16			15.00, Nov. 22	11.00, June 7		
1937	2.512c., Mar. 9	2.249c., Jan. 4		19.73, Nov. 24	18.73, Aug. 11			21.92, Mar. 30	12.92, Nov. 10		
1936	2.249c., Dec. 28	2.016c., Mar. 10		18.84, Nov. 5	17.83, May 14			17.75, Dec. 21	12.67, June 9		
1935	2.062c., Oct. 1	2.056c., Jan. 8		17.90, May 1	16.90, Jan. 27			13.42, Dec. 10	10.33, Apr. 29		
1934	2.118c., Apr. 24	1.945c., Jan. 2		16.90, Dec. 5	13.56, Jan. 3			13.00, Mar. 13	9.50, Sept. 25		
1933	1.953c., Oct. 3	1.792c., May 2		14.81, Jan. 5	13.56, Dec. 6			12.25, Aug. 8	6.75, Jan. 5		
1932	1.915c., Sept. 6	1.870c., Mar. 15		15.90, Jan. 6	14.79, Dec. 15			8.50, Jan. 12	6.43, July 3		
1931	1.981c., Jan. 13	1.883c., Dec. 29		18.21, Jan. 7	15.90, Dec. 16			11.33, Jan. 6	8.50, Dec. 29		
1930	2.192c., Jan. 7	1.962c., Dec. 9		18.71, May 14	18.21, Dec. 17			15.00, Feb. 18	11.25, Dec. 9		
1929	2.236c., May 28	2.192c., Oct. 29						17.58, Jan. 29	14.08, Dec. 3		
Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.				Based on average for basic iron at Valley furnace and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.				Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.			

Summary of the Week

INDUSTRIAL activity continues to expand in many directions from the combined impetus of national defense projects and developments not directly associated with the defense program.

While the nation ingot rate has slipped a point and a half this week to 89½ per cent of capacity, this is of no significance because the decline is mostly accounted for by the shutdown for vacation of one plant in the Pittsburgh district, reducing the rate there six points to 81 per cent. There were minor declines, none over a point, in the Cleveland, Wheeling-Weirton and Southern Ohio districts, but offsetting these were advances in Detroit, Buffalo and Chicago.

The volume of steel buying in the early part of August has dropped somewhat below that of the corresponding July period, but the comparison is of little value because of the unusually heavy tonnages booked in the first week of July. What concerns the steel industry most is the large volume of business that lies immediately ahead.

In addition to the growth of steel orders and inquiries for defense projects, there is the entry into the market last week and this week of the automobile industry, whose purchases of steel for 1941 model production are growing; also the expansion of railroad purchases, which in the past week have amounted to 4205 freight cars, 18 large locomotives, two streamlined trains, 21 stainless steel coaches and 51 passenger cars. The War Department will buy 2000 cars for troop transport at an estimated cost of \$15,000,000. Large purchases of rails are possibly foreshadowed by the action of rail mills in extending the present price of \$40 a ton to Nov. 1, next, for delivery until June 30, 1941.

DEFENSE projects roughly fall in two categories, those which produce an almost immediate call on the mills for steel and those which will require a good deal of time for tooling up before steel will be needed. Many of the contracts now being awarded fall within the latter classification and will constitute a large reservoir of business for the steel mills later on, but meanwhile steel orders and inquiries are increasing for hull and boiler steel for naval ships, boiler tubes, shell rounds, structural steel and sheet piling for Navy and private shipyard additions. The demand for wide plates has been such that deliveries are extended to as long as eight weeks. Prospective additions to the merchant shipbuilding program will increase the pressure for plates in coming months. Only in sheets, strip and tin plate is there a downward trend. Some sheet and strip mills are "hungry" for orders, while tin plate continues in a seasonal decline, operations being estimated at 69 per cent.

Export tonnage, especially from Great Britain, but also from Canada, where industrial expansion is now

• Industrial activity expands
... Automobile industry begins buying of steel for 1941 models ... More railroad equipment buying ... Steel needs for defense projects increasing ... Scrap prices move up for first time in nearly two months.

proceeding rapidly for war needs, continues to run at a high rate. Government figures show that June exports of steel and pig iron totaled 617,678 gross tons, a 30 per cent increase over the 471,481 tons sent out in May. It is indicated that July exports probably were still higher. British demand for low phosphorus pig iron is greater than the available supply.

THE scrap market, diverted from an upward course during the period of rising steel operations in the past two months by a series of upsetting events, has experienced rising prices quite generally this week. Low phosphorus grades, used chiefly by electric furnaces, have been in sharp demand, with resultant price increases. No. 1 heavy melting steel is higher at Pittsburgh, Chicago and Philadelphia, bringing about an increase of 46c. a ton to \$18.63 in THE IRON AGE scrap composite quotation.

With scrap exports still in substantial volume despite the invoking of the licensing provision of the May-Sheppard Act, steel companies are concerned over the possibility of another sharp rise in scrap prices, bringing about increased costs which they see no chance to recover through higher steel prices. The National Defense Advisory Commission, which is keeping a close watch over all price movements, including those in the scrap market, is doing everything it can short of outright price control to keep the prices of raw materials used by the steel industry from rising unduly. Should scrap prices go up sharply, the commission is prepared to recommend the inclusion of other grades than No. 1 heavy melting steel in the licensing system.

A MODIFIED form of priority rating for steel orders placed for national defense work has been adopted by the Army and Navy Munitions Board. While there is said to be no need at present for formal priorities, each order henceforth will bear a preference classification and desired delivery date to assist the steel companies in affording full cooperation with the defense program.

The Industrial Pace . . .

WHILE THE NATIONAL DEFENSE program, so far as its effect upon domestic industry as a whole is concerned, is still in the embryo stage, the contributions of this project to what might be called the primary industries is weekly growing more tangible. Outstanding example of this influence is the rise in heavy construction activity over the past few weeks. Total awards in the past week were \$76,453,000, down slightly from the previous week, but still well over the average of the past three months. This average at the close of the past week stood at \$72,400,000, as compared with \$59,200,000 a month ago and \$54,200,000 six months ago.

While privately financed construction activity thus far this year is running about 25 per cent above the comparable period of a year ago, the spurt in the volume of awards in recent weeks has been due primarily to Federal activity. Federal projects awarded in the past week amounted to \$40,558,000; state and municipal work to \$24,213,000 and private work to \$11,682,000.

It is quite probable that once the tax and amortization program is settled, privately financed work will rise sharply for a period and boost construction activity still higher.

REFLECTING THIS INTENSIFIED building activity, the total of contracts for heavy engineering projects awarded in July (see graph) rose to \$347,852,000, highest since March, 1930. In this instance, too, the gain was due entirely to federal activity, which

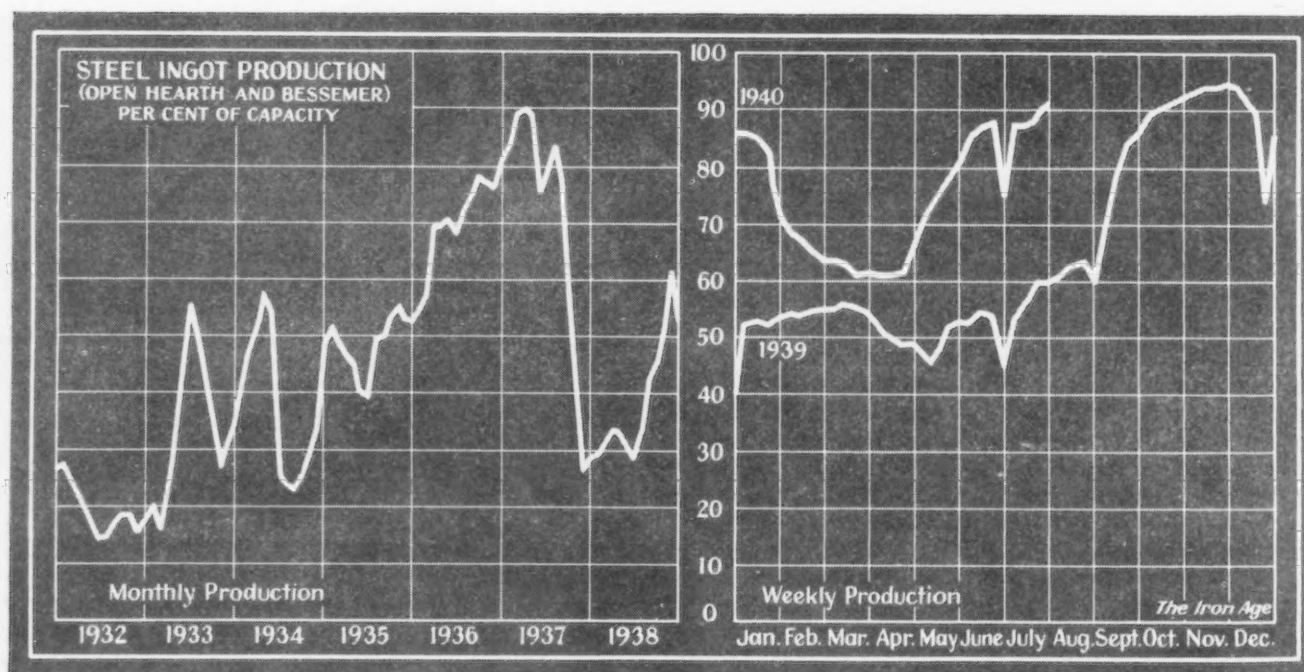
in July reached an all-time peak of \$172,217,000, while privately financed work declined to \$68,550,000 from \$92,044,000 in June.

Despite the rapid increase in activity in plants of steel consumers and steadily rising costs of raw materials, the cost of finished steel in July (see graph), based on THE IRON AGE composite, remained unchanged from the levels prevailing since last November (excepting the short "bargain" period in April of this year), a level 10 per cent below the high point of 1937.

THE SLOW BUT STEADY expansion of operations in the durable goods industries continued in the past week, according to THE IRON AGE index of capital goods activity, but the practical cessation of automobile assemblies for the model changeover period caused a fractional dip in the combined index number to 84.1 from 84.3 in the previous week. Moderate rises in the steel and construction series were offset by 5.4 point drop in the automobile series.

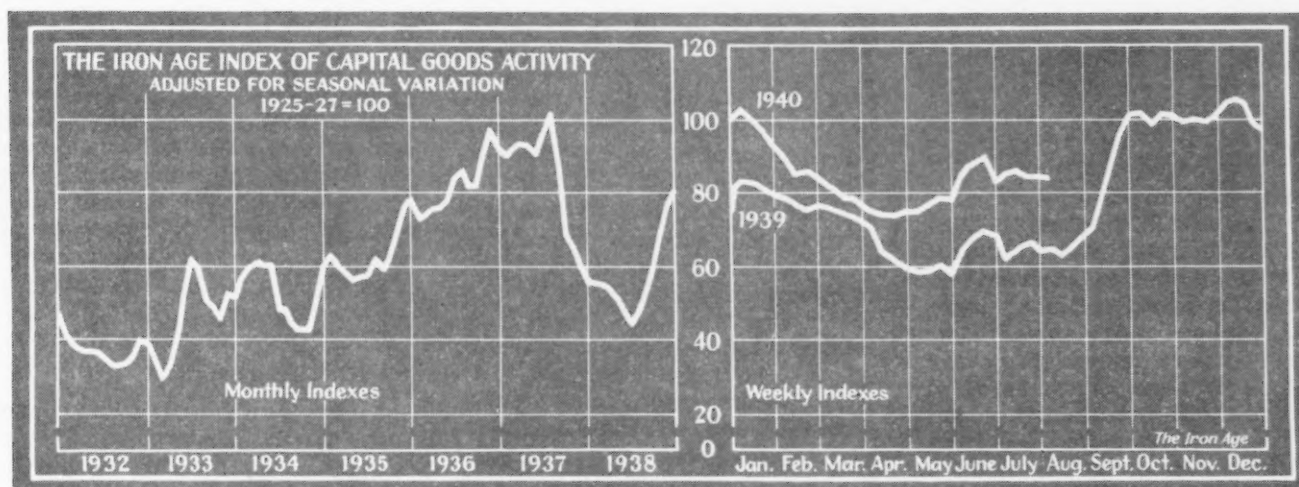
In comparison with 1929, the lumber carloadings series is the outstanding laggard of the index. However, the sharp increase in the letting of construction awards in recent weeks should, when the projects enter the actual building stage, have a direct influence of this series. Excepting the automobile series, which will undoubtedly rise rapidly once production on the new models begins, the largest improvement over the next few months may be expected to occur in the lumber series.

Steel Output Eases to 89.5% of Capacity



District Ingot Production, Per Cent of Capacity		Pitts-	Chicago	Valleys	Phila-	Cleve-	Buffalo	Wheel-	Detroit	S. Ohio	West-	St. Louis	East-	Aggre-
		burgh			delphia	land		ina		River	ern		ern	gate
Current Week . . .		81.0	97.0	90.0	93.0	84.0	101.0	103.0	95.5	93.0	89.0	63.0	73.5	89.5
Previous Week . . .		87.0	96.5	90.0	93.0	85.0	98.0	104.0	100.0	93.0	89.5	63.0	73.5	91.0

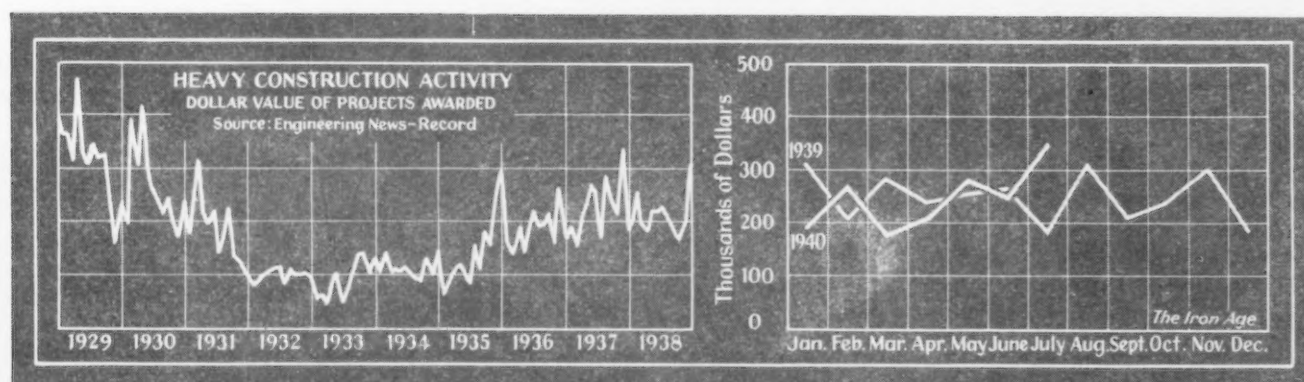
Auto Changeover Retards Upward Movement of Index



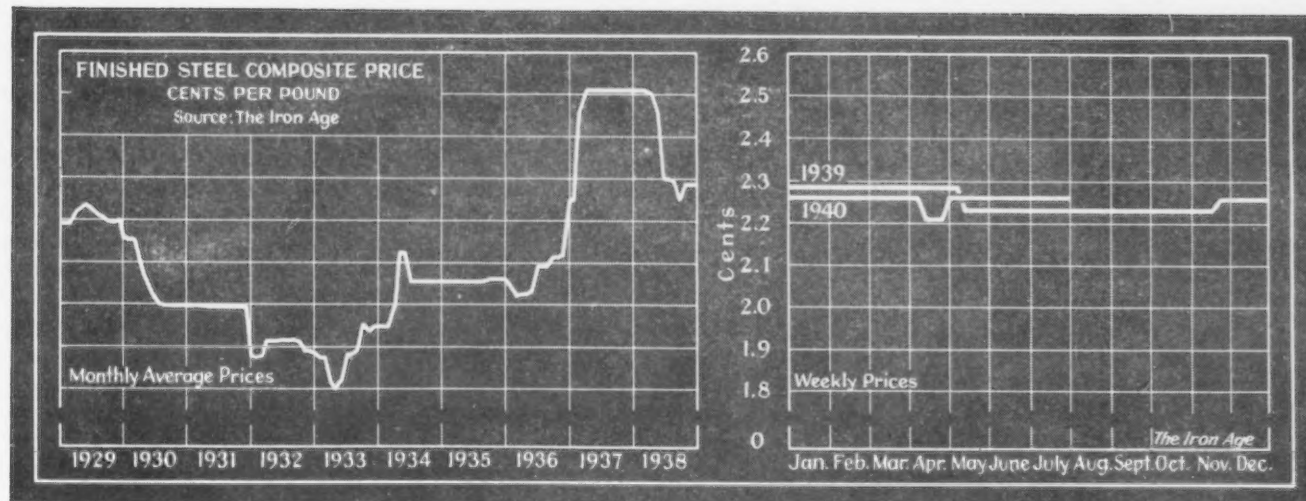
Component	Week Ended	Aug. 10	Aug. 3	July 13	Aug. 12 1939	Aug. 10 1929
Steel ingot production ¹		131.3	129.3	128.1	88.3	132.8
Automobile production ²		21.0	26.4	62.9	32.7	121.6
Construction contracts ³		90.3	87.1	71.6*	68.6	120.1
Forest products carloadings ⁴		67.7	67.9	55.9	59.0	121.2
Pittsburgh output and shipments ⁵		110.3	110.8	106.3	77.0	127.8
COMBINED INDEX		84.1	84.3	85.0*	65.1	124.7

Sources: ¹ THE IRON AGE; ² Wards Automotive Reports; ³ Engineering News-Record; ⁴ Association of American Railroads; ⁵ University of Pittsburgh. Indexes of forest products carloadings and activity in Pittsburgh area reflect conditions as of week ended Aug. 3. Other indexes cover week of Aug. 10. *Revised.

Defense Needs Push Building Awards to 10-Year Peak



July Finished Steel Price 10% Below 1937 High



Market News

...THE WEEK'S ACTIVITIES IN IRON AND STEEL

New Business

...Automotive and railroad buying a feature of the week

...Up until late last week total steel specifications at PITTSBURGH were running somewhat less than in the corresponding July period, which was unusually active. However, within the past few days fresh export purchases, coupled with moderate increase in automotive specifications, have done much to fill up the gap between comparisons as of today and a month ago. Industrial vacations have exerted some effect but general steel demand continues at high levels and incoming business is still at a rate close to practical capacity. Weekly comparisons are unsatisfactory under present conditions, and it is expected that no important change in the trend of new steel business will occur in the near future. Structural shape, plate and bar orders are still the most active in a well diversified list of orders.

U. S. Naval and Merchant shipbuilding in the present national emergency have brought approximately \$65,000,000 in business to the Pittsburgh district and, by the time additional appropriations have been spent or contracts let, the Pittsburgh district industries will have received another \$105,000,000 in orders, a grand total for the year of \$170,000,000. This information, in addition to other pertinent data is contained in a survey completed by K. P. Allen, member of the U. S. Naval Institute, the Propeller Club of the United States, and chairman of the Pittsburgh Industrial Commission's maritime committee. Highlights of Mr. Allen's report were as follows:

Out of every dollar appropriated for shipbuilding, 40.6 per cent goes for material, 39.1 per cent to labor and the balance of 20.3 per cent goes for other expenses and profit. Out of every \$1,000,000 appropriated, Mr. Allen states 1,000,000 man hours of labor are provided—491,000 at the construction site and approximately 509,000 in mines, factories, transportation and administration. Out of every

\$1,000,000 spent for naval construction, \$406,000 goes into materials of which the Pittsburgh district supplies about 25 per cent.

General industrial activity in the CHICAGO district continues at a high level. Railroad car shops are busy with orders for freight cars and prospects are good for a substantial increase in the near future. Many orders have been received there for the American defense program, but so far the surface is believed merely to have been scratched.

In the past week or so, some volume orders for sheets have been received in that district from the automobile industry. Though the bulk of buying for the 1941 cars is yet to be seen, it was stated that sheet orders were now being received at a good rate.

Though incoming orders in the CHICAGO district are still keeping close to shipments, some Chicago sales offices during August to date have experienced losses as compared with the corresponding period of July amounting to as much as 30 per cent. Apparently the major factor in this decline is the absence of sheet tonnage from today's orders whereas a month ago sheets were a big item. Demand for other products seems to be holding up.

CLEVELAND showed a sharp drop in new business, but aggregate tonnage at YOUNGSTOWN was heavier than usual. Prospects for large scale buying in the fall remain undiminished, and, if United States armament purchases proceed on schedule, production capacity will be severely taxed. Coke, electric furnace alloy steel, low phos pig iron and semi-finished steel facilities are already overburdened. Heat treating provides another bottleneck. In proportion to capacity, order backlogs are very large for stranded galvanized wire and cable. The British have been heavy buyers of this material, which is used for balloon barrages.

In the PHILADELPHIA market a leveling off process in new orders has been noted. This situation, however, is believed to be temporary as automotive business and na-

tional defense requirements will soon make themselves felt. Among national defense needs soon to be filled is 75,000 tons of steel for gun forgings, 2500 tons for shells and a sizable tonnage of armor plate and other steel for the heavy tanks to be built by the Baldwin Locomotive Works.

Steel Operations

...Rate for industry down one and a half points to 89½ per cent

Mostly because of a six-point decline at PITTSBURGH to 81 per cent, the average ingot production rate for the steel industry this week is 89½ per cent, down a point and a half from last week. There were other declines, but they were of minor importance. The CLEVELAND and WHEELING-WEIRTON districts each lost a point and SOUTHERN OHIO half a point.

However, there were also gains, DETROIT being up four and a half points, BUFFALO up three points and CHICAGO up half a point. Other districts are unchanged from last week.

The sharp drop at PITTSBURGH was due to a vacation shutdown of one plant.

Despite the fact that most of the major plants are operating at 90 per cent or higher, there are some companies whose operations are below 50 per cent. They are not large factors individually, but collectively they represent a fair amount of capacity.

Prices

...Heavy rail price of \$40 extended to Nov. 1... changes on pipe

...The present price of \$40 a gross ton for standard rails has been extended so that all orders taken by Nov. 1 for shipment up to June 30, 1941, will obtain this quotation.

Producers are stiffening the line pipe market toward obtaining published price levels, an action considered long overdue and made necessary by the heavy demand for raw steel. (For pipe changes see Tubular Goods.)

Pig Iron

... Export sales the principal feature of market

••• Other than export sales to the British, which aggregate a substantial tonnage, pig iron markets are quiet. Shipments are in good volume, but nearly all domestic consumers are covered by contracts and therefore new buying is light. This situation prevails quite generally throughout the country. Melting operations in some districts are gradually expanding, partly as the result of national defense projects. The starting of 1941 model production by the automobile industry has resulted in an improvement in the melt in the territory contiguous to Detroit.

Demand from the British for low phosphorus pig iron remains in excess of available production.

Some concern is felt over future supplies of coke. An Eastern producer is unable to accept further orders for prompt delivery, but has indicated it will accept future orders at 50c. a ton above current quotations.

The fifth blast furnace at the Inland Steel Co. plant was blown in last week.

Semi-Finished Steel

... Volume of orders continues at a high level

The volume of fresh semi-finished specifications continues at a high level and, although support from English buying had been lacking up until late last week, fresh purchases have been made within the past few days at a rate comparable with previous placements. Non-integrated mills are still taking steel freely, skelp is moving at recent levels, and domestic wire rod demand has improved. Some steel companies have found it necessary to either move semi-finished supplies between plants or in one case at least it has been found necessary to purchase material from another company in order to correct some production problems.

Production and shipments continue steady at CLEVELAND while at YOUNGSTOWN schedules of one principal seller have reached a new peak.

Wire Products

... Automotive support growing ... Exports an important factor

Total wire sales are not much if any above a month ago but an improved demand for wire rods and manufacturers' wire has been noted within the past week. Some of these increases are due to automotive support. Export business is still an important factor in the wire market.

CLEVELAND reports that demand has been more spotty recently. Here and there extremely strong activity is noted while other consumers are only moderately busy. Some wire drawers have found their capacity insufficient to meet pressing requirements, and are ordering wire instead of rods to fill orders. CLEVELAND producers are offering common manufacturers' wire and small rods in reasonably quick time, but backlogs on large rods are growing more extended. Releases from the automotive industry are expected this week and will provide a better clue to the extent of fall activity. Large backlogs in relation to productive capacity are held in strands and ropes. The British, in addition to large rod orders, are seeking quick shipment on around 1800 tons of galvanized strands for balloon barges for ocean vessels. The British have been producing barbed wire at a high rate. The United States armament program is requiring much galvanized material.

Reinforcing Steel

... Awards total 11,750 tons, inquiries 12,450 tons

Reinforcing steel awards of 11,750 tons include 2000 tons for improvements at the Portsmouth Navy Yard, N. H.; 1950 tons for a power plant for the Union Electric Co., Venice, Ill., and 1500 tons for a flood protection project at Hartford, Conn.

New reinforcing steel projects call for 12,450 tons. The largest inquiries are 7000 tons for a power plant substructure at Bonneville, Ore.; 1500 tons for submarine base improvements at New London, Conn., and 1000 tons for a submarine assembly shop at the Brooklyn Navy Yard.

Bolts, Nuts and Rivets

... Production of these products in an upward trend

Bolt and nut and cap screw production at CLEVELAND is moderately higher. Automotive shipments grew heavier last week and further acceleration is expected this week. In a very short time the full extent of the automobile industry's needs will be apparent. Rivet makers assert demand is slow, except for some spot shipbuilding tonnages, but the summer as a whole has been above normal compared to the past few years. Prospects for rivet buying are promising from the railroad and construction fields and in the building of large combat tanks.

Merchant Bars

... Larger automotive orders are expected this week

The hot rolled bar market at PITTSBURGH has been furnished support within the past few days by automotive business and it is expected that total orders from that source will be substantial this week. Meanwhile, miscellaneous business and export business, especially from the British, remains an important supporting factor. Delivery promises on alloy steel bars are no better than a week ago.

Demand for hot rolled carbon bars in CHICAGO is still holding up well and orders are exceeding shipments in some cases. Forgers, cold drawers and makers of farm implements and industrial and farm tractors, remain the leading consumers.

Orders at CLEVELAND fell off last week, but this month's tonnage to date is about even with July. Prospects remain bright, particularly in regard to shell work of all descriptions.

Tin Plate

... Operations slightly lower but shipments are large

Export tin plate prospects still remain small compared with several months ago, and domestic consumers are not placing fresh orders at anywhere near the rate in June and July. Shipments, however, continue at recent levels with mill stocks being slowly reduced. Operations are down one point this week to 69 per cent.

Shipbuilding

... Ingalls gets contract for three merchant ships

The Maritime Commission last week awarded a \$12,297,000 contract to Ingalls Shipbuilding Corp., Birmingham, for the construction of three C-3 type passenger-cargo ships for the American South African Line, Inc. To require a total of 13,110 tons of steel, the

three vessels will be steam propelled.

At the same time, the commission postponed from Aug. 20 to Sept. 11, the opening of bids for the construction of three modified C-2 type vessels to be built for the Ocean Dominion Steamship Corp. These ships will require an estimated 10,800 tons of steel and will be designed to carry bauxite for the Aluminum Co. of America.

Structural Steel

... Awards 21,400 tons, new projects light

Fabricated structural steel awards, at 21,400 tons are slightly lower than those of a week ago. The outstanding lettings are 2100 tons for a plant at Texas City, Tex., for the Union Carbide & Carbon Co.; 1035 tons for a machine shop for the Puget Sound Navy Yard, Bremerton, Wash.; 1000 tons for a storage shop and tool building for the Douglas Aircraft Co., Santa Monica, Cal., and 1000 tons for a power house for the American Gas & Electric Service Corp., Deepwater, N. Y.

New structural steel projects declined to 9425 tons from 23,845 tons last week. The largest new inquiries reported are 1400 tons for a highway bridge in Bradford County, Pa.; 1100 tons for a mental defective school at Willowbrook, N. Y., and 1000 tons for a viaduct in Huntingdon County, Pa.

Sheet steel piling totaling 11,000 tons will be required for the aviation facilities at Coco Solo, C. Z., for which Lindgren & Swinnerton, Tucker McClure, Hegeman-Harris are joint contractors. The purchase is expected to be completed comparatively soon.

Structural mills are running at an exceedingly high rate and the moderate upturn in new fabricating awards, coupled with expected tonnages, indicates a good production setup for some time to come.

Sheets and Strip

... Automotive business to be more important factor soon

Cold rolled sheet specifications from automobile companies have been in moderate volume within the past few days and substantial tonnages are expected to be specified this week. This business reflects the first real ordering for initial 1941 models. The flat rolled industry is in need of automotive support which has been lacking during the shutdown period but it has been noted recently that miscellaneous business, although not large as far as individual orders are concerned, has nevertheless become more diversified. This latter condition has been especially true with regard to hot rolled sheets. Hot and cold rolled strip specifications



CASTINGS

Finished or Unmachined

MANY times, where highly specialized requirements must be met by steel specifications that usually incur expensive alloys, you will find only a nominal cost increase by substitution of Nelo or Nelo Molybdenum . . . Steel castings unmachined, machined or flame-hardened under one control from raw material to finished product as ordered . . . Get Bulletin 6A giving complete characteristics of Nelo and Nelo Molybdenum Steel Castings.

NATIONAL-ERIE
CORPORATION
 ERIE, PA., U.S.A.

have also shown some improvement lately.

Orders for sheets for the 1941 models of automobiles are finally being received in the CHICAGO district in fairly good volume. Though it is agreed that the bulk of the 1941 requirements is still to be seen, it is nevertheless true that the automotive releases in the past two weeks have been greater than for some time. Sheet demand otherwise is negligible as was to be expected following the widespread covering at the \$4 a ton concession in price. It is still believed by most of the large sheet producers that the low priced tonnages will have been erased from the books by Sept. 30. The question confronting the industry now is what the situation will be at that time, when the full market price will theoretically apply on all orders. On all new business being placed today it is understood that the full market price applies, and it is also understood that consumers with large orders on the books now for shipment before Sept. 30, are paying the full price for sheets to be delivered in October.

CLEVELAND also reports a moderate gain in releases from the automotive industry, with additional improvement expected momentarily. Bids opened last Monday at Rock Island Arsenal for approximately 350 tons of metallic machine gun links made of cold strip. Delivery on the first 50 tons was desired in early September.

Sheet steel demand in the SOUTHERN OHIO district is averaging about 70 per cent of mill capacity with operations at about 80 per cent.

Export Trade

... Unshipped pig iron and steel offered for resale

Reports of the availability of "blitzkrieg" bargains, material originally sold to various European countries to which shipments cannot now be made are growing more numerous in the New York area. Plates, sheets, strip, merchant and concrete bars and wire rods are among the items being offered by various export houses for resale. A substantial tonnage of pig iron is also available, but because of the inability of obtaining required

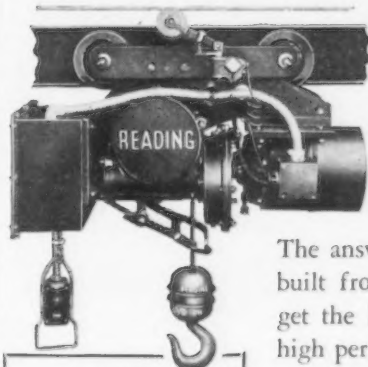
documents from the Norwegian owners of the material for repossession, holders of this iron are unable to resell it. Most of these lots are comparatively small, the largest being around 250 tons, and, while some of this material has been resold at slight concessions below the present replacement cost, it is not believed that it will have any important influence of either the present domestic price or the export price.

Tubular Goods

... Stiffening of prices on line, merchant and structural pipe

Total tubular sales at PITTSBURGH are slightly ahead of a month ago due in part to a pickup in oil casing specifications. The improvement, however, falls short of tube makers' expectations. Short lines and miscellaneous sizes of line pipe continue to lend substantial

144 STANDARD SINGLE DRUM ELECTRIC HOISTS TO CHOOSE FROM



**CHOOSE IN
EACH UNIT
ONE STANDARD
MECHANISM
AND COMBINE**

CONTROL UNIT MECHANISMS

1. Pendent cord
2. Rigid arm push button
3. Pendent push button
or
Special controls

SUSPENSION UNIT MECHANISMS

1. Built-in trolley
2. Swivel trolley
3. Hand geared trolley
4. Motor driven trolley
5. Hook
6. Lug

MOTOR UNIT MECHANISMS

1. A.C. current, 110 to 550 volts in all phases and cycles.
2. D.C. current, 115 to 300 volts inclusive.

HOISTING UNIT MECHANISMS

1. Parallel mounting
2. Right angle mounting
3. Single line hoist
4. Two part line hoist

Each time you must depart from *standard* in the purchase of electric hoists—costs jump and maintenance problems multiply. Yet your hoisting problems are different from those of others.

The answer is to have your electric hoists *custom* built from *standard* mechanisms. That way you get the low cost of *standard* equipment *plus* the high performance of equipment built to meet your own requirements.

You can have that with Reading's UNIT CONSTRUCTION PLAN. You may select any one of the standard mechanisms listed under each unit and combine them to give the one hoist best suited to your needs. 144 different hoists are thus available. Each is standard. Each may be powered for any current characteristic.

Without obligation, send today for Bulletin 1004 describing in detail Reading's *Unit Construction Plan*. Specifications and dimensions also included. Use this coupon.

READING

Electric Hoists, Cranes, Monorails and Chain Hoists

READING CHAIN & BLOCK CORPORATION, DEPT 21
READING, PA.

Gentlemen: Without obligation, send me your new Bulletin 1004 on Reading Electric Hoists.

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(FIRM NAME MUST BE GIVEN)

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CITY _____ STATE _____

support to pipe tonnage sales. Within the past few weeks line pipe prices have stiffened considerably and business is being transacted at a level higher than that of a few months ago.

At CLEVELAND and YOUNGSTOWN order backlogs are large and include considerable tonnage for South America, in addition to large amounts of merchant pipe for domestic construction projects.

Makers of structural pipe have told customers that this item will only be furnished in butt weld pipe up to and including 3 in. in diameter and will no longer be furnished in electric weld or lap weld grades. Special structural pipe cutting extras have been withdrawn and regular cut length extras for standard pipe will apply. The base price on structure pipe is now 1½ points higher discount or \$3 a ton

lower price than on standard pipe giving a net price approximately the same as heretofore when the base price of structural pipe was quoted at 5 per cent less than the base price of standard pipe, the latter method having been discontinued.

Another change involving all full weight threaded and coupled pipe is that the uniform stock lengths will be 21 ft. instead of 20 ft. as heretofore, a condition which was pretty well known by the trade and had been anticipated.

If the customer insists on 16 ft. dead lengths, an extra of 2 points or \$4 a ton will be charged, on 18 ft. lengths there will be an extra of 1½ points or \$3 a ton and on 20 ft. lengths an extra of 1 point or \$2 a ton. No difficulty is expected because most customers will probably order the base length of 21 ft.

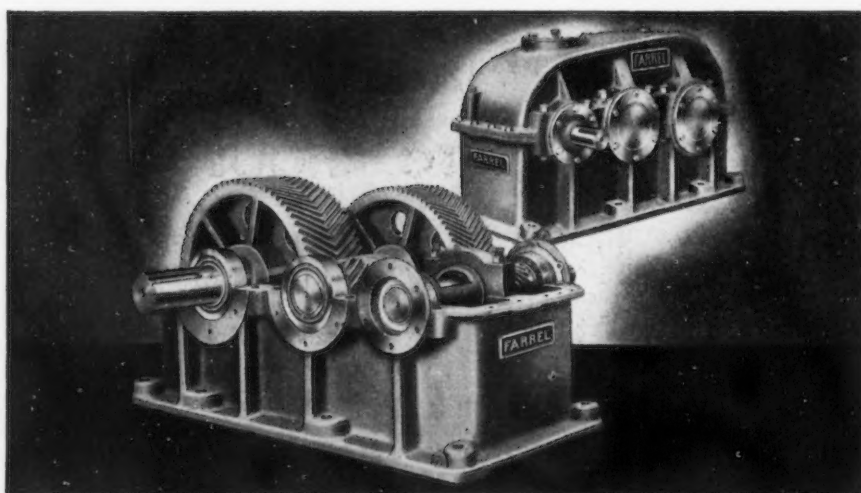
Construction of an 80,000,000 gas line from Texas to the Philadelphia-New York industrial area—1500 miles—is sought in an application for a certificate of convenience and necessity filed with the Federal Power Commission by the Reserve Gas Pipe Line Co., of Dallas, Tex. To be operated at a pressure of 1000 lb. per sq. in., the projected pipe line would consist of 1500 miles of 24 in. pipe., requiring an estimated 674,000 tons. It would be financed by Glore, Forgan & Co., of Chicago.

J. Wallace Bostick, president of the applicant company, told the commission that such a project would have a large national defense value; that there is at present no natural gas service available to consumers in the Philadelphia-New York industrial area; and that approval of the line would enable the ultimate consumer to purchase gas from distributing companies at rates below those now paid for existing gas service.

Railroad Buying

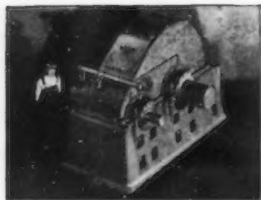
... 4205 freight cars, 18 locomotives and other equipment ordered

... Equipment buying in the past week, which included what is believed to be the largest passenger locomotive purchase on record, showed a substantial improvement



Double Reduction Unit—Type DR

FARREL GEAR UNITS



Farrel Heavy Duty Mill Drives are ruggedly built to withstand the stresses, shocks and wear encountered in modern mill practice.



Send for Catalog No. 438 giving complete descriptions, specifications, ratings and dimensions.

Excel in Uniform, Silent and Positive Power Transmission

Farrel Gear Units are noted for smooth, quiet operation and dependable performance under all conditions. This is due to their precision generated continuous tooth herringbone gears, famous for extra strength and durability; to accurate mounting of shafts in anti-friction roller bearings and to heavy cases, strong and rigid enough to prevent deflection and vibration.

Farrel Gear Units have been developed in a complete line for all types of applications and service conditions. Designs include single, double and triple reduction units, speed change units with two or more selective speeds, speed increasing units, right angle units and special drives to meet special requirements. All types and sizes are totally enclosed and self-contained. They are standardized in general design, but with flexibility in detail which permits variation to suit specific conditions of speed, load and service.



FARREL-BIRMINGHAM COMPANY, INC.

333 VULCAN STREET - - - BUFFALO, N. Y.

The Gear with a Backbone

over recent weeks. The week's activity included the purchase of 4205 freight cars, 18 large locomotives, two streamlined trains, 21 stainless coaches, and 51 passenger cars. Only new equipment program of any magnitude reported in the week was that of the War Department covering 2000 cars for troop transport. Complete details are not yet available on this project, but cost is estimated to be in excess of \$15,000,000.

Atlantic Coast Line has purchased 1565 freight cars, allocated as follows: 200 drop end gondolas, 500 55-ton hopper, and 100 phosphate cars to Bethlehem Steel Co.; 100 50-ton auto box and 50 stock cars to Mt. Vernon Car Mfg. Co.; 600 box and 15 cement cars, to Pullman Standard Car Mfg. Co.

Louisville & Nashville has purchased 100 box cars from Pullman Standard Car Mfg. Co.

Southern Pacific freight car program announced last week will take approximately 30,000 to 33,000 tons of steel. Allocation of the 2540 cars was as follows: 500 box cars each to Pressed Steel Car Co., General American Transportation Corp., and Bethlehem Steel Co.; 500 automobile box cars to Mt. Vernon Car Mfg. Co.; 350 ballast cars to American Car & Foundry Co., and 125 flat cars, 15 drop end gondolas, and 50 steel caboose cars to the railroad's own car shops.

Including the Southern Pacific, Atlantic Coast Line, and Louisville & Nashville awards mentioned above, 25,163 freight cars have been ordered since the first of the year.

Atlantic Coast Line has ordered 18 2000-hp. diesel electric passenger locomotives from the Electro-Motive Corp. and Atlantic Coast Line and Pennsylvania have jointly ordered 21 stainless steel streamlined coaches from the Edward G. Budd Mfg. Co., Philadelphia.

Two streamlined aluminum alloy trains, costing \$4,000,000, have been ordered jointly by Chicago & North Western, Southern Pacific and Union Pacific. Each train will consist of 17 cars to be pulled by 6000-hp. diesel-electric locomotives. Cars will be built by Pullman Standard Car Mfg. Co., and locomotives by Electro-Motive Corp.

Southern Pacific has ordered 51 light weight streamlined passenger cars, costing \$3,500,000, from Pullman Standard Car Mfg. Co.

Duluth Missabe & Iron Range is asking bids on eight steam freight locomotives. Reading is speeding up its car repair program and expects to make extensive repairs to 200 cars monthly in September, October, November and December.

Steel Companies Make Up Guard Members Pay

Chicago

••• Civil service examinations are being conducted here for 75 machinists and five tool and gage designers for the Rock Island Arsenal. It is understood that qualified applications for these jobs have been disappointingly few. The maximum age limit in the arsenal has been raised from 55 to 62 years.



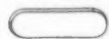
Service Die & Engineering Company, Detroit, made this complete die on the DoAll. It is used

to make the glove compartment on the instrument panel of a well-known automobile.



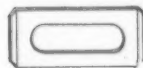
DIE

DIE— $2\frac{1}{4}$ " thick mild steel was sawed out in $1\frac{3}{4}$ hours.



PAD

PAD— $1\frac{1}{2}$ " thick air die steel, sawed out in $2\frac{1}{2}$ hours. 25 pounds of steel were saved.



STRIPPER

STRIPPER— $\frac{3}{4}$ " cold roll, sawed out in 45 minutes.



KNOCKOUT

KNOCKOUT— $\frac{3}{4}$ " cold roll, sawed out in 30 minutes.



CAM DRIVE

CAM DRIVES (on the DoAll table)— $2\frac{1}{2}$ " oil hardened tool steel, sawed out in 20 minutes each. Later they were welded to base.

Two DoAll Contour Machines and one DoAll Band Filer are kept busy 24 hours a day in this modern plant.

The DoAll is a moderately priced, rugged machine tool that replaces shaping, milling and lathe work with enormous savings of time, labor and metal.

Send for Free 158-page Metal Working Handbook.

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☐ Send Free Handbook.

NAME

ADDRESS

Machine Tools

... SALES, INQUIRIES AND MARKET NEWS

U. S. Plants Get French Tools

New York

••• Machine tools originally purchased by France, but taken over by the British since the capitulation of France, are beginning to move into American plants, with preference being given to plants working on defense contracts. Equipment involved is mostly of the type urgently needed for work on defense contracts. Machines purchased by Japan, but held up by inability to obtain export licenses are also moving into nearby plants, with the Japanese buyers cooperating generously in facilitating such shipments. The Russian situation, however, is still somewhat confused, with the Soviet agents still extremely hesitant about releasing proscribed machines for transfer to American manufacturers. Some competition is being encountered by domestic sellers from owners of machines originally sold for export.

Meanwhile domestic demand for heavy tools continues unabated with deliveries growing longer each week. Sales in the light tool field, however, slackened slightly in the past week. This recession

is attributed partly to vacation periods and partly to hesitation of some companies, with new equipment programs on paper, to go forward until the federal amortization and tax program is worked out.

Steady Order Flow

Cincinnati

••• Orders continue to flow steadily into district plants and the managements continue to apply their attention to production problems primarily. In current demand, milling and grinding machinery continues to be most active, with lathes and similar types of machinery coming a close second. The balance of business is well distributed over other types, keeping all plants in full production, with substantial backlogs.

Armament Program Expedited

Cleveland

••• Producers here have been gratified at recent rapid progress toward eliminating confusion on priorities, export licenses and other matters. Entire armament situation has more clarity now

than was the case a month ago. Cooperation of the British has been noteworthy in releasing some of the old French orders which they hold in order to help expedite the United States armament program.

With producers thus enabled to shift their schedules some of the important projects in this vicinity will go ahead quickly. Equipment for the manufacture of gun carriages at Ellwood City will be delivered in September and October instead of next May, and similar speed will be provided the diesel engine works of General Motors Co. here on several items recently ordered, including a boring mill. At the moment Erie, Pa., appears to be the most active city in this vicinity. It is reported another large order for 75 mm. guns will be produced there, while turbine manufacture and other departments are unusually busy.

Red Tape Delays Buying

Chicago

••• Orders and inquiries for machine tools in the Chicago district continue at a high level, and the month of August will probably show a gain over July. The arsenal at Rock Island placed several orders last week, including milling machines, punch presses, and horizontal and vertical boring mills. Goss Printing Press Co., which has an order for naval gun mounts, has not yet started its machine tool buying program due to delays in final arrangements at Washington.

Navy Planning Purchases

Boston

••• Bureau of Supplies and Accounts, Washington, contemplates placing 10 engine lathes, four vertical turret lathes and three lathes electrically controlled for the Newport, R. I., torpedo station; 12 milling machines, two shapers, one milling machine and one boring, drilling and milling machine for the Boston navy yard; and two milling machines for the South Boston dry dock.

July Gear Sales Second Highest on Record

After showing a slight recession in June, sales of industrial gears, exclusive of automotive gearing, in July rose to a rate exceeded only once since records were begun in 1928, according to American Gear Manufacturers Association. The July index of sales reported by the association was 141, equal to the peak of October, 1939, and exceeded only by the index of 195 reported for March, 1937. The highest point reached in 1929 was 140 in March. The July figure represents a gain of 9.3 per cent over the June index and 58 per cent over July, 1939.

The average index for the first seven months of the current year is 126, 38 per cent above the average of 92 for the comparable period of 1939.



Non-Ferrous Metals

... MARKET ACTIVITIES AND PRICE TRENDS

New York, Aug. 13—Despite the favorable rate of shipment of non-ferrous metals into consumption, concern over the consequence of the war caused a weakening in the price structure of copper, lead and tin in the past week. In the case of lead, imported material was also a factor, but probably not as important as the uncertainty felt over possible future developments.

On Wednesday the primary copper producers took cognizance of the weakness of the market and dropped prices $\frac{1}{2}$ c to 11c a lb., delivered Connecticut Valley. This was the level the custom smelters had been quoting and the reduction by the large producers brought a further recession in smelter's quotations to 10.875c. Today smelter interests were quoting 10.75c with little consumer response. As usual in periods of price weakness, buyers retired from the market shortly after the price cut and sales for the week were in very moderate volume. However, the high rate of consumption over the past several months and the absence of indications of a possible letdown in the immediate future, suggests that some consumers will undoubtedly require additional substantial tonnages to support fall operations. Normally this buying could be expected around the end of the present month. Export demand, principally from the Japanese, was in fair volume all week and prices showed little fluctuation from the 9.90c a lb. f.a.s. level. Japanese demand is generally limited to small lots to round out cargoes and invariably calls for prompt shipment.

In an unexpected movement, lead prices were cut \$3 a ton on last Tuesday afternoon, the first price movement since April 2, and another \$2 on Friday. While the reductions were inspired to some degree by the growing problem of lead imports, which, at the time of the price cut, were being offered at about 4.98c a lb., duty paid, the failure of domestic buyers to cover forward needs as freely as in the

past was the chief factor in the price cuts. Following the second reduction, which brought prices down to 4.75c a lb., New York, there was a moderate consumer response, but demand is still on the light side.

Zinc

A further recession in prime western sales was shown for the past week, probably a reflection of the price weakness in copper, lead and tin. Sales for the period were 3647 tons, as compared with 6615 tons in the preceding week. Shipments for the week at 6236 tons indicated a continuance of the pace of recent weeks. Backlogs of prime western material now stand at 57,220 tons. Ability of smelter to resist the weakness in the other

metals is due partly to the export demand. Domestic prices remain unchanged at 6.64c. a lb., New York.

Tin

Dullness brought a further decline in Straits prices over the past week, considerably reducing the spread between the futures price and the government buying price of 50c. Prompt Straits today are quoted at 51.375c. per lb., New York, as compared with 52.25c. a week ago. A slight flurry of activity developed on Monday in August and September arrivals, but little material actually changed hands.

Cash standards in London this morning were quoted at £263 and three months' metal at £263 15s.

(Nonferrous Prices on Page 113)

DURIRON Circulating Steam Jets heat, agitate, stir pickling liquors



Complete circulation of pickle liquor . . . rapid heating . . . no destructive pounding. Duriron Heating and Circulating Steam Jets heat quicker, save the tank — and acid — and cut down steam requirements.

Use **DURIRON** Jets for sulphuric acid—**DURICHLOR** Jets for muriatic acid.

Send for Bulletin No. 1801, which includes a table for figuring the steam requirements in pounds per hour for your size tank.

THE DURIRON COMPANY, Inc., 438 N. Findlay Street, Dayton, Ohio

Scrap

... MARKET ACTIVITIES AND QUOTATION TRENDS

••• After remaining unchanged for three consecutive weeks at \$18.17, THE IRON AGE composite price rose 46c. this week to \$18.63, bringing it 8c. below the week of July 9, which marked the third week of the decline from the June high of \$19.58.

All the three principal districts contributed to the increase, the Pittsburgh average rising 25c., Chicago 62.5c., and Philadelphia 50c. All districts reported a much stronger undertone and practically all price revisions made this week were upward. The lack of active mill buying still keeps the actual market position in a somewhat hazy position and, though the price rises in heavy melting steel in the principal districts are predicated upon actual mill sales, movements

Heavy demand from Canada is being felt in several districts in the central area, as well as Buffalo, and is reported to be a factor in the new strength shown over the past 10 days. Details of export shipments in June are published elsewhere in this issue.

The Japanese last week made a few additional commitments, covering only moderate tonnages, at prices generally about 75c. above those paid for by the preceding purchase. Material covered by this latest purchase is for prompt shipment, Sept. 15 being the deadline specified in most instances.

Pittsburgh

Market undertone is definitely stronger and received some of its strength from higher prices obtained for railroad heavy melting steel which is quotable this week at \$20.50 to \$21, up \$1 from a week ago. Although no sales of ordinary No. 1 heavy melting have been made within the past week at any higher than \$18.50, the lower range of \$18 is definitely out as some brokers have paid \$18.50 to cover on old orders. No. 1 heavy melting is quotable this week at a flat \$18.50, up 25c. from last week's average. Turnings, both open-hearth and blast furnace grades, are definitely stronger and a continuing demand for low phos. specialties has pushed these items up 50c. a ton.

Chicago

Heavy melting steel is quoted this week at \$17.75 to \$18, positive indications being available of a mill sale at the higher level. Brokers in some cases can still buy for \$17.75 from dealers, but it is becoming increasingly difficult to obtain material

under \$18. A large Western road in its monthly accumulation of scrap, which totaled about 6000 tons, received for the No. 1 steel around \$19, gross ton, delivered, to a Chicago district mill. Rerolling rails sold for nearly \$22, delivered, and the on-track offering prices for cast and steel wheels were \$17.75, gross, and \$20.70, gross, respectively.

Philadelphia

Small sales of No. 1 heavy melting steel were reported this week at \$19.50, a 50c. advance over last week's quotations and up 75c. from prices current two weeks ago. No. 2 steel is quoted at \$18, also an advance of 50c. Cast scrap has advanced and blast furnace grades are quoted at a flat \$12. Brokers state that scrap is very tight and higher prices will be needed to bring it out. Export prices on No. 1 and No. 2 steel are up 50c. to \$18 and \$17 respectively.

Youngstown

Except for an upward revision of \$1 a ton on the low phos. quotation, forced by a large demand from electric furnace buyers, the market remains the same here at the start of this week, although the undertone is stronger than at any time in the past month. No. 1 heavy melting steel at \$18.50 to \$19 a ton is likely to prove low when tested by large scale buying.

Cleveland

The market here appears stronger than a week ago, although fresh mill buying is lacking. Dealers claim difficulty in obtaining material and say they cannot buy at \$18. Scrap from the North has diminished in volume, apparently due to strong demand from Canada.

Buffalo

Except for scrap rails, prices are unchanged here for the second consecutive week. The scrap rail differential has been widened from a \$20.50 to \$21 quotation to \$20 to \$21. A strong undercurrent is evident with brokers reporting the first comparatively heavy demand for specialties in some time. An increased demand for scrap for electric furnace consumption has been noted.

St. Louis

Trading here continues quiet and there is a disposition to await developments before making commitments. Undertone of the market is firmer, owing chiefly to shrinkage in offerings. Prices are nominally unchanged. Railroad offerings: Gulf Coast Lines, 1565 tons; Chicago, Rock Island & Pacific, 600 tons; Chicago & Eastern Illinois, 580 tons; Louisville & Nashville, 7996 tons, and Southern, 6216 tons.

Birmingham

Prices appear to be steady and material is coming in with normal volume. Export dealers in this section are studying interpretations placed on the admin-

istration's licensing order. Prices as of Aug. 1 remain in effect.

Cincinnati

With boom sentiment pervading the market here, dealer feeling tends to be more optimistic, contributing a strong undertone to the current market. Except for a few adjustments upward, dealers' bids are unchanged. Mill interests in further material is totally lacking.

Detroit

Buoyant market conditions, influenced to a considerable degree by sales of Detroit scrap in other areas, particularly for Lake shipment, have carried prices up another 50c. to 75c. in the second successive weekly climb. Scrap production has recovered sharply from the summer low as automotive plants have gone back into production. An automotive body list closes

New York

The stronger undertone first apparent here two weeks ago was converted into minor increases in the past week. The increases generally coincided with the advances in eastern Pennsylvania. Loading for export continues without any significant change in pace. Thus far no difficulties have been experienced in obtaining export licenses. However, the licenses thus far cover cargoes which had been charted previous to application of the restrictions and no test has been made yet of cargoes arranged since the restrictions were applied.

Boston

With American Steel & Wire Co. and Washburn Wire Co. temporarily out of the market, and Pennsylvania mill and New England foundry buying limited, the domestic market is in the doldrums. For Weirton delivery brokers are paying \$7.88 a ton on cars for steel turnings and \$11.15 a ton on cars for bundled skeleton, and for Eastern Pennsylvania delivery \$11.40 a ton on cars for bundled skeleton on old orders. In the export market shippers pay \$16.25 a ton delivered dock for No. 1 steel and \$14.75 a ton for No. 2 steel in a majority of transactions, although sales of No. 1 steel were made at \$16 a ton on dock the past week and at \$14.50 a ton for No. 2. Exporting is con-

Toronto

Heavy buying by both dealers and consumers featured Canadian markets for the past week, while prices held firm and unchanged. Dealers state that offerings showed further improvement in both steel and iron materials, while demand kept pace and deliveries to melters and little over for yard stocks. Both steel mills and foundries are taking all offerings and are placing contracts for as far ahead as dealers will close. Inventories among foundries are comparatively low, while the big mill consumers in the Hamilton area are fairly well provided for some time ahead. Big imports from the United States are augmenting Canadian supplies, deliveries from across the line being up about 200 per cent from a year ago.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.50
Railroad heavy mltng.	\$20.50 to 21.00
No. 2 heavy mltng.	16.50 to 17.00
Railroad scrap rails.	21.50 to 22.00
Rails 3 ft. and under.	23.50 to 24.00
Comp. sheet steel.	18.50
Hand bundled sheets.	17.50
Heavy steel axle turn.	17.50 to 18.00
Machine shop turnings	14.00 to 14.50
Short shov. turnings.	16.00 to 16.50
Mixed bor. & turn.	12.50 to 13.00
Cast iron borings	12.50 to 13.00
Cast iron carwheels.	20.00 to 20.50
Heavy breakable cast.	17.00 to 17.50
No. 1 cupola cast.	19.50 to 20.00
RR. knuckles & coup.	25.00 to 25.50
Rail coil springs.	25.00 to 25.50
Rail leaf springs.	25.00 to 25.50
Rolled steel wheels.	25.00 to 25.50
Low phos. billet crops.	23.50 to 24.00
Low phos. punchings.	25.00 to 26.00
Low phos. heavy plate.	23.50 to 24.00
Railroad malleable	23.50 to 24.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$19.50
No. 2 hvy. mltng. steel.	18.00
Hydraulic bund., new.	19.50
Hydraulic bund., old.	\$16.00 to 16.50
Steel rails for rolling.	22.00 to 22.50
Cast iron carwheels.	21.00 to 21.50
Hvy. breakable cast.	20.00
No. 1 cupola cast.	21.00 to 21.50
Mixed yard (f'd'y) cast	18.00 to 18.50
Stove plate (steel wks.)	16.00 to 16.50
Railroad malleable	22.50 to 23.00
Machine shop turn.	14.00
No. 1 blast furnace.	12.00
Cast borings	12.00
Heavy axle turnings.	16.50 to 17.00
No. 1 low phos. hvy.	24.00 to 24.50
Couplers & knuckles.	24.00 to 24.50
Rolled steel wheels.	24.00 to 24.50
Steel axles	23.50 to 24.00
Shafting	24.50 to 25.00
Spec. iron & steel pipe	17.00 to 17.50
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:

Per Gross Ton	
Hvy. mltng. steel.	\$17.75 to \$18.00
Auto. hvy. mltng. steel	
alloy free	16.75 to 17.00
No. 2 auto steel.	14.25 to 14.75
Shoveling steel	17.75 to 18.00
Factory bundles	17.25 to 17.50
Dealers' bundles	15.75 to 16.00
No. 1 busheling	16.75 to 17.00
No. 2 busheling, old.	8.00 to 8.50
Rolled carwheels	20.50 to 21.00
Railroad tires, cut	21.00 to 21.50
Railroad leaf springs.	19.50 to 20.00
Steel coup. & knuckles.	20.50 to 21.00
Axle turnings	16.25 to 16.75
Coll springs	22.00 to 22.50
Axle turn. (elec.)	17.00 to 17.25
Low phos. punchings.	20.50 to 21.00
Low phos. plates 12 in. and under	20.50 to 21.00
Cast iron borings.	10.50 to 11.00
Short shov. turn.	11.50 to 12.00
Machine shop turn.	11.50 to 12.00
Rerolling rails	21.50 to 22.00
Steel rails under 3 ft.	19.75 to 20.25
Steel rails under 2 ft.	21.00 to 21.50
Angle bars steel	20.00 to 20.50
Cast iron carwheels.	18.00 to 18.50
Railroad malleable	22.00 to 22.50
Agric. malleable	14.75 to 15.25

Per Net Ton

Iron car axles	23.50 to 24.00
Steel car axles	22.00 to 22.50
Locomotive tires	15.00 to 15.50
Pipes and flues	11.50 to 12.00
No. 1 machinery cast.	16.50 to 17.00
Clean auto. blocks	17.25 to 17.75
No. 1 railroad cast.	15.00 to 15.50
No. 1 agric. cast.	13.50 to 14.00
Stove plate	10.75 to 11.25
Grate bars	12.50 to 13.00
Brake shoes	12.50 to 13.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.50 to \$19.00
No. 2 hvy. mltng. steel.	17.50 to 18.00
Low phos. plate	21.50 to 22.00
No. 1 busheling	17.75 to 18.25
Hydraulic bundles	18.00 to 18.50
Machine shop turn.	13.00 to 13.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
No. 2 hvy. mltng. steel.	17.00 to 17.50

Comb. sheet steel	\$17.50 to \$18.00
Light bund. stampings	14.50 to 15.00
Drop forge flashings.	17.00 to 17.50
Machine shop turn.	11.50 to 12.00
Short shov. turn.	12.00 to 12.50
No. 1 busheling.	17.25 to 17.75
Steel axle turnings.	17.00 to 17.50
Low phos. billet and bloom crops	23.00 to 23.50
Cast iron borings.	12.00 to 12.50
Mixed bor. & turn.	12.00 to 12.50
No. 2 busheling.	12.00 to 12.50
No. 1 cupola cast.	20.50 to 21.00
Railroad grate bars.	14.00 to 14.50
Stove plate	14.00 to 14.50
Rails under 3 ft.	23.00 to 23.50
Rails for rolling	23.00 to 23.50
Railroad malleable	21.50 to 22.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
No. 2 hvy. mltng. steel.	16.00 to 16.50
Scrap rails	20.00 to 21.00
New hvy. b'ndled sheets	16.00 to 16.50
Old hydraulic bundles.	14.50 to 15.00
Drop forge flashings.	16.00 to 16.50
No. 1 busheling	16.00 to 16.50
Machine shop turn.	11.00 to 11.50
Shov. turnings	13.00 to 13.50
Mixed bor. & turn.	11.50 to 12.00
Cast iron borings.	11.50 to 12.00
Knuckles & couplers.	22.00 to 22.50
Coll & leaf springs.	22.00 to 22.50
Rolled steel wheels.	22.00 to 22.50
No. 1 machinery cast.	19.50 to 20.00
No. 1 cupola cast.	18.00 to 18.50
Stove plate	15.50 to 16.00
Steel rails under 3 ft.	23.50 to 24.00
Cast iron carwheels.	18.00 to 19.00
Railroad malleable	22.00 to 23.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	\$15.50 to \$16.00
No. 1 hvy. melting.	15.00 to 15.50
No. 2 hvy. melting.	14.00 to 14.50
No. 1 locomotive tires.	17.50 to 18.00
Misc. stand. sec. rails.	17.50 to 18.00
Railroad springs	19.00 to 19.50
Bundled sheets	10.50 to 11.00
Cast bor. & turn.	9.00 to 9.50
Machine shop turn.	8.00 to 8.50
Heavy turnings	11.25 to 11.75
Rails for rolling	19.50 to 20.00
Steel car axles	21.00 to 21.50
No. 1 RR. wrought.	12.50 to 13.00
No. 2 RR. wrought.	14.00 to 14.50
Steel rails under 3 ft.	20.75 to 21.25
Steel angle bars	17.25 to 17.75
Cast iron carwheels.	17.50 to 18.00
No. 1 machinery cast.	19.00 to 19.50
Railroad malleable	18.50 to 19.00
Breakable cast	15.75 to 16.25
Stove plate	11.50 to 12.00
Grate bars	12.00 to 12.50
Brake shoes	12.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	\$14.00 to \$14.50
No. 2 hvy. mltng. steel.	12.50 to 13.00
Scrap rails for mltng.	19.50 to 20.00
Loose sheet clippings.	9.50 to 10.00
Hydrau. b'ndled sheets	13.25 to 13.75
Cast iron borings	5.50 to 6.00
Machine shop turn.	6.50 to 7.00
No. 1 busheling	10.00 to 10.50
No. 2 busheling	4.25 to 4.75
Rails for rolling	21.00 to 21.50
No. 1 locomotive tires.	16.25 to 16.75
Short rails	21.50 to 22.00
Cast iron carwheels.	15.50 to 16.00
No. 1 machinery cast.	18.00 to 18.50
No. 1 railroad cast.	16.50 to 17.00
Burnt cast	10.00 to 10.50
Stove plate	10.00 to 10.50
Agricul. malleable	14.50 to 15.00
Railroad malleable	17.50 to 18.00
Mixed hvy. cast	15.25 to 15.75

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting steel	\$15.00
No. 2 hvy. melting steel	14.00
No. 1 busheling	13.00
Scrap steel rails	15.00
Steel rails under 3 ft.	17.50
Rails for rolling	17.50
Long turnings	5.00
Cast iron borings	8.50
Stove plate	11.00
Steel axles	18.00
No. 1 RR wrought.	12.00
No. 1 cast	16.00
No. 2 cast	12.50
Cast iron carwheels.	13.00
Steel carwheels	15.00

DETROIT

Dealers' buying prices per gross ton, f.o.b. cars:

No. 1 heavy melting.	\$15.00 to \$15.50
No. 2 heavy melting.	14.00 to 14.50
Borings and turnings.	10.75 to 11.25
Long turnings	9.75 to 10.25
Short shov. turnings.	10.75 to 11.25
No. 1 cast	18.50 to 19.00
Automotive cast	18.50 to 19.00
Hvy. breakable cast.	15.00 to 15.50
Stove plate	11.75 to 12.25
Hydraul. Comp. sheets	17.00 to 17.50
New busheling	16.00 to 16.50
Sheet clips	14.00 to 14.50
Flashings	15.00 to 15.50
Low phos. plate	18.50 to 19.00

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	13.50 to 14.00
Hvy. breakable cast.	15.50 to 16.00
No. 1 machinery cast.	17.50 to 18.00
No. 2 cast	15.00 to 15.50
Stove plate	11.00 to 11.50
Steel car axles	20.00 to 20.50
Shafting	20.00 to 20.50
No. 1 RR. wrought.	14.50 to 15.00
No. 1 wrought long.	13.00 to 13.50
Spec. iron & steel pipe	12.00 to 12.50
Rails for rolling	16.50 to 17.50
Clean steel turnings*	9.00 to 9.50
Cast borings*	8.50 to 9.00
No. 1 blast furnace.	8.50 to 9.00
Cast borings (chem.)	10.00 to 11.00
Unprepared yard scrap	8.00 to 8.50
Light iron	6.00 to 6.50

Per gross ton delivered local foundries:

No. 1 machin. cast.	\$18.00 to \$19.00
No. 2 cast	16.00 to 16.50

* \$1.50 less for truck loads.

BOSTON

Dealers' buying prices per gross ton:

Breakable cast	\$13.75 to \$14.00
Machine shop turn.	7.88 to 8.00
Mixed bor. & turn.	6.00
Bun. skeleton long.	11.15 to 11.40
Shafting	18.50 to 18.75
Stove plate	9.65 to 9.75
Cast bor. chemical.	8.00 to 8.50

Per gross ton delivered consumers' yards:

Textile cast	\$17.00 to \$20.00
No. 1 machine cast.	17.00 to 19.00

Per gross ton delivered dealers' yards:

No. 1 hvy. mltng. steel.	\$13.75 to \$14.00
No. 2 steel	12.75 to 13.00

PACIFIC COAST

Per net ton delivered to consumer:

	San Fran.	Los Ang.	Seattle
No. 1 hvy. mltng. steel	\$13.00	\$13.00	\$13.00
No. 2 hvy. mltng. steel	12.00	12.00	12.00
Bundles	11.00	11.00	11.00

CANADA

Dealers' buying prices at these yards, per gross ton:

Toronto Montreal	
Low phos. steel.	\$11.50 \$11.00
No. 1 hvy. mltng. steel.	11.25 10.75
No. 2 hvy. mltng. steel.	10.00 9.50
Mixed dealers steel.	8.75 8.25
Drop forge flashings.	9.75 9.25
New loose clippings.	8.75 8.25
Busheling	6.00 5.50
Scrap pipe	7.75 7.25
Steel turnings	7.25 6.75
Cast borings	6.75 6.25
Machinery cast	20.00 19.00
Dealers' cast	19.00 18.00
Stove plate	14.50 13.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges	
No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	14.00
No. 2 cast	14.50 to 15.00
Stove plate	12.50

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	\$16.00 to \$16.25
No. 2 hvy. mltng. steel.	14.50 to 14.75
Rail (scrap)	16.00 to 16.50

Philadelphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.	\$17.75 to \$18.00
No. 2 hvy. mltng. steel.	16.50 to 17.00

Construction Steel

...STRUCTURAL STEEL, REINFORCING BARS, PLATES, PILING, ETC.

Fabricated Steel

Lettings slightly higher at 21,400 tons; new projects decline to 9425 tons from 23,845 tons last week; plate awards total 4600 tons.

AWARDS NORTH ATLANTIC STATES

- 1000 Tons, Deepwater, N. J., power house for American Gas & Electric Service Corp., to Fort Pitt Bridge Works Co., Pittsburgh.
- 980 Tons, New York, apartment building, 90th Street and Central Park West, to American Bridge Co., Pittsburgh.
- 884 Tons, Erie, Pa., extension to General Electric building No. 63, to Ingalls Iron Works Co., Birmingham.
- 637 Tons, Lockport, N. Y., building extension for Harrison Radiator Co., to Ingalls Iron Works Co., Birmingham.
- 600 Tons, Niagara Falls, N. Y., factory building No. 98 for Union Carbide Co., to Bethlehem Steel Co., Lackawanna, N. Y.
- 575 Tons, Middlesex, Pa., State viaduct, to Bethlehem Steel Co., Bethlehem, Pa.
- 480 Tons, New York, apartment building, 44 East 67th Street, to Dreier Structural Steel Co., New York.
- 355 Tons, Bound Brook, N. J., factory building for Calco Chemical Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 310 Tons, Bethel, Me., field house for Gould Academy, to American Bridge Co., Pittsburgh.
- 270 Tons, Barber, N. J., flue system for American Smelting & Refining Co., to Belmont Iron Works, Philadelphia.
- 215 Tons, Duncansville, Pa., State underpass, to American Bridge Co., Pittsburgh.
- 205 Tons, Rehoboth Beach, Del., Dewey Beach bridge for State, to Phoenix Bridge Co., Phoenixville, Pa.
- 165 Tons, Erie, Pa., building for Johnson Metal Products Co., to Rogers Structural Steel Co., Corry, Pa.
- 160 Tons, Chelmsford-Lowell, Mass., State bridge, to Bethlehem Steel Co., Bethlehem, Pa., through B. Perini & Sons, Inc., Framingham, Mass., contractor.
- 160 Tons, Groton, Conn., storage building for Electric Boat Co., to Bethlehem Fabricators, Bethlehem, Pa.
- 150 Tons, Brooklyn, Belt Parkway, contract E, to Joseph T. Ryerson & Son, Inc., New York, through Ross Galvanizing Works, Inc., contractor.
- 150 Tons, Sullivan County, N. Y., State highway bridge, to Phoenix Bridge Co., Phoenixville, Pa.
- 100 Tons, Butler County, Pa., bridge, to Fort Pitt Bridge Works Co., Pittsburgh.
- 100 Tons, Tonawanda Township, N. Y., pattern shop for Farrel-Birmingham Co., to R. S. McMannus Steel Construction Co., Inc., Buffalo.

THE SOUTH

- 2100 Tons, Texas City, Tex., Union Carbide & Carbon Corp plant, to Mosher Steel Co., Dallas, Tex.
- 875 Tons, Corpus Christi, Tex., aircraft storehouse, to Austin Brothers, Dallas, Tex.
- 850 Tons, Jackson, Miss., glass and lamp factory for General Electric Co., to Pidgeon Thomas Iron Works, Memphis, Tenn.
- 835 Tons, Pensacola, Fla., paper mill, to Stupp Brothers Bridge & Iron Co., St. Louis, through Rust Engineering Co., Pittsburgh.
- 630 Tons, Sheffield, Ala., power house units 3 and 4, Pickwick Dam, for TVA, to American Bridge Co., Pittsburgh.
- 600 Tons, Gilbertsville, Ky., bridge for TVA, to Bethlehem Steel Co., Bethlehem, Pa.
- 350 Tons, Mobile, Ala., building for Southeastern Air Depot, to Southern Steel Works Co., Birmingham.
- 200 Tons, Baton Rouge, La., boiler house for Solvay Process Co., to Ingalls Iron Works Co., Birmingham.
- 136 Tons, Birmingham, recreational building and gymnasium for Birmingham-Southern College, to Southern Steel Works Co., Birmingham.
- 110 Tons, Fort Worth, Tex., Texas & Pacific Railroad Co. bridge spans, to Virginia Bridge Co., Roanoke, Va.
- 100 Tons, Alcoa, Tenn., building extension for Aluminum Co. of America, to Southern Steel Works Co., Birmingham.

CENTRAL STATES

- 840 Tons, Chicago, warehouse and train shed for Sherwin-Williams Co., to Joseph T. Ryerson & Son, Inc., Chicago.
- 810 Tons, Comstock, Mich., Commonwealth & Southern Corp. power house extension, to American Bridge Co., Pittsburgh.
- 380 Tons, Columbia, Mo., State bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.
- 365 Tons, Dearborn, Mich., Military Avenue grade separation, to American Bridge Co., Pittsburgh.
- 320 Tons, Rolling Prairie, Ind., State bridge No. 4993 to Bethlehem Steel Co., Bethlehem, Pa.
- 210 Tons, Granville, Ohio, Science building, Denison University, to R. C. Mahon Co., Detroit.
- 200 Tons, Racine, Wis., office building and machine shop, Twin Disc Clutch Co., to Wisconsin Bridge & Iron Co., Milwaukee.
- 200 Tons, Lake Forest, Ill., State grade separation, to Bethlehem Steel Co., Bethlehem, Pa.
- 180 Tons, Red Lake County, Minn., State bridge, to American Bridge Co., Pittsburgh.
- 115 Tons, Dayton, Ohio, housing project, to Midwest Ornamental Iron Works, Chicago.
- 110 Tons, Dayton, Ohio, Apex Tool factory, to Burger Iron Co., Akron, Ohio.
- 110 Tons, Racine, Wis., bridge, to Wisconsin Bridge & Iron Co., Milwaukee.

WESTERN STATES

- 1035 Tons, Bremerton, Wash., Navy machine shop building (Specification 9906), to Pacific Car & Foundry Co.
- 1000 Tons, Santa Monica, Cal., storage shop and tool buildings, Douglas Aircraft Co., to Bethlehem Steel Co., Bethlehem, Pa.
- 364 Tons, San Francisco, United States Division Engineer (Invitation 868-41-19), to Columbia Steel Co., San Francisco.
- 330 Tons, Malta, Mont., Great Northern Railway Co. bridge No. 469, to American Bridge Co., Pittsburgh.
- 275 Tons, Seattle, Wash., Continental Can Co. building, to Wisconsin Bridge & Iron Co., Milwaukee.
- 240 Tons, Denver, Lowry Field technical school, to E. Burkhardt & Sons Steel & Iron Works Co., Denver.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

- 1400 Tons, Bradford County, Pa., highway bridge; bids in.
- 1100 Tons, Willowbrook, N. Y., State mental defective school building.
- 1000 Tons, Huntingdon County, Pa., State highway viaduct.
- 550 Tons, Mercer County, Pa., highway bridge, Howes & Farrell, low bidders on general contract.
- 400 Tons, Amherst Township, N. Y., theater and store for Guelich & Boebel, Buffalo.
- 335 Tons, Fayette, Pa., highway bridge on route 117; bids Aug. 23.
- 200 Tons, Fairfield, Conn., bridge No. 3807 for New York, New Haven & Hartford Railroad Co.
- 150 Tons, Baychester Station, bridges 769-785, Hutchinson River Parkway for New York, New Haven & Hartford Railroad.
- 110 Tons, Ridgefield, N. J., power house addition for Lowe Paper Co.
- 100 Tons, Midvale, Pa., building for American Viscose Corp.; bids in.
- 100 Tons, Boston, Navy Yard steel storage plant extension.
- 100 Tons, Newstead Township, N. Y., Cedar Street bridge; William J. Gallagher, general contractor.

THE SOUTH

- 500 Tons, Charleston, W. Va., office building for United Carbon Co., bids in.
- 200 Tons, Rutledge, Tex., trashracks, Marshall Ford Dam, for U. S. Bureau of Reclamation; bids Aug. 22.
- 100 Tons, Charlestown, W. Va., post office; bids Aug. 16.

CENTRAL STATES

- 500 Tons, St. Louis, paint shop for American Car & Foundry Co.; bids taken Aug. 12.
- 400 Tons, Chicago, Fuller Elementary School.
- 350 Tons, Youngstown, Mahoning Avenue bridge reconstruction; bids Aug. 17.
- 300 Tons, Pontiac, Mich., factory addition for Yellow Truck & Coach Mfg. Co.

Weekly Bookings of Construction Steel

Week Ended →	Aug. 13,	Aug. 6,	July 16,	Aug. 15,	Year to Date	
	1940	1940	1940	1939	1940	1939
Fabricated structural steel awards	21,400	20,045	49,125	10,745	574,425	612,575
Fabricated plate awards	4,600	6,090	2,825	1,105	98,305	108,295
Steel sheet piling awards	390	2,615	4,510	815	30,660	43,440
Reinforcing bar awards	11,750	7,925	8,100	4,055	287,210	297,500
Total Letting of Construction Steel	38,140	36,675	64,560	16,720	990,600	1,061,810

- 200 Tons, Chicago, U. S. Tobacco Co. power house; bids Aug. 15.
 165 Tons, Marion, Mich., beam spans for State.
 130 Tons, Kimberly, Wis., alterations to factory No. 27 for Flour Bros. Con. Co.
 120 Tons, Columbus, Ohio, Alum Creek bridge for Franklin County.
 100 Tons, Columbus, Livingston Avenue bridge.

WESTERN STATES

- 800 Tons, Bonneville, Ore., power plant substructure; bids Aug. 30.
 335 Tons, Fairbanks, Alaska, Army buildings (Invitation 110); bids in.
 270 Tons, Stockton, Cal., Army hangar (Invitation 6616-41-16); bids Aug. 27.

FABRICATED PLATES AWARDS

- 4000 Tons, Cleveland and Lorain, Ohio, anti-submarine net tenders for American Shipbuilding Co., to Carnegie-Illinois Steel Corp., Pittsburgh.
 300 Tons, Detroit, derrick barge for Dunbar & Sullivan, to Ingalls Iron Works Co. (Birmingham Tank Co.) Birmingham.
 300 Tons, New York, tanks and fermenters for U. S. Industrial Chemical Co., to Ingalls Iron Works Co., Birmingham.

PENDING PROJECTS

- 8325 Tons, St. Louis, 15 barges for Inland Waterways Co., American Bridge Co., Pittsburgh, low bidder.
 2500 Tons, Cincinnati, eight covered cargo barges for Federal Barge Lines.
 2000 Tons, Cincinnati, two car floats for Federal Barge Lines.

SHEET PILING

AWARDS

- 390 Tons, East Chicago, Ind., United States Gypsum Co. dock, to Inland Steel Co., Chicago, through H. A. Thompson, contractor, Chicago.

PENDING PROJECTS

- 700 Tons, Bonneville, Ore., power plant substructure, bids Aug. 30.
 345 Tons, Seattle, scapane ramp at Naval Air Station (Specification 8943).
 335 Tons, Portland, Ore., United States Engineer (Invitation 698-41-62); bids Aug. 19.

Cast Iron Pipe

Everett, Mass., has just floated a \$15,000 water main loan and has placed 1000 ft. of 14-in. pipe privately.

Simmesport, La., closes bids Aug. 24 for pipe lines for water system and other waterworks installation, including deep-well pumping machinery, elevated steel tank and tower and other facilities. Cost about \$38,000. Financing has been arranged. Max M. Merriek, Marksville, La., is consulting engineer.

Island Lake Water Co., care of F. F. Litchfield, 9 South County Street, Waukegan, Ill., president, plans pipe lines for water system at Wauconda and other points in Lake and McHenry Counties.

Falls City, Neb., will award contract to Layne-Western Co., 1010 West Thirty-ninth Street, Kansas City, Mo., for about 13 miles of pipe lines for water system, drilling of four wells, installation of pumping equipment and other waterworks facilities. Cost about \$325,000.

Town Board, West College Corner, Ind., John McCreary, president, asks bids until Aug. 26 for 14,590 ft. of 8, 6, 4 and 2-in. cast iron pipe for water system, with alternate bids on asbestos-cement pipe; also for fittings, gate valves, valve boxes, hydrants, meters and accessory equipment. Municipal Engineering Co., Plainfield, Ind., is consulting engineer.

New Holland, Ohio, plans pipe lines for water system and other waterworks installation, including water-softening plant and pumping station. Cost about \$112,000. Financing has been arranged through Federal aid. Burgess & Niple, 568 East Broad Street, Columbus, Ohio, are consulting engineers.

Myrtle Beach, S. C., plans pipe line extensions and improvements in water system, now being acquired from South Carolina Utilities, and other waterworks installation. Fund of \$160,000 has been arranged through RFC for entire project, including water system purchase noted.

Mission Township Committee, Topeka, Kan., Jay Shideler, RD 8, clerk, will take bids soon for pipe lines for water system in district near Topeka, including 75,000-gal. elevated steel tank and tower, pumping station and other waterworks installation. O. J. Ediman, New England Building, Topeka, is consulting engineer in charge.

East Point, Ga., has plans for pipe line extensions in water system, including new main pipe line between water reservoir and filtration plant, about 11 miles long; also new pumping station and other waterworks installation. Cost about \$600,000. Financing is being arranged through Federal aid, with \$250,000 of amount noted to be bond issue.

Kansas City, Kan., will take bids soon for new 24-in. main water line across Kaw River to connect with municipal reservoir in Argentine district. Cost over \$60,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Reinforcing Steel

Awards of 11,750 tons; 12,450 tons in new projects

AWARDS

ATLANTIC STATES

- 2000 Tons, Portsmouth, N. H., Navy Yard improvements, to Bethlehem Steel Co., Bethlehem, Pa., through Bancroft-Martin Aberthaw Co., contractor.
 1500 Tons, Hartford, Conn., flood protection project, to Truscon Steel Co., Youngstown, through A. I. Savin Construction Co., Hartford.
 500 Tons, Chicopee, Mass., Dwight Street pumping station and dike, to Joseph T. Ryerson & Son, Inc., Cambridge, Mass., through B. A. Gardette, Inc., Roxbury, Mass., contractor.
 350 Tons, Windsor, Conn., mesh, highway project, to American Steel & Wire Co., Cleveland, through New Haven Road Construction Co., New Haven, Conn.
 214 Tons, New York, City Island and Hart Island sewage plant, to Truscon Steel Co., Youngstown, through John L. Washborne.
 163 Tons, Tioga County, Pa., mesh for Route 21 project, to Truscon Steel Co., Youngstown, through C. G. Construction Co.
 120 Tons, Johnson City, N. Y., Erie Railroad grade elimination, to Bethlehem Steel Co., Bethlehem, Pa., through Binghamton Construction Co.
 100 Tons, Rochester, N. H., hospital, to Concrete Steel Co., Boston.

SOUTH AND CENTRAL

- 1850 Tons, Venice, Ill., Union Electric Co. power plant, to Laclede Steel Co., St. Louis, through Western Foundation Co., contractor.
 900 Tons, State of Michigan, various jobs for Michigan Bell Telephone Co., to Truscon Steel Co., Youngstown, Ohio.
 250 Tons, Wheeling, W. Va., Vineyard housing project, to West Virginia Rail Co., Huntington, W. Va., through Don J. Byrum, Inc., contractor.
 200 Tons, Appleton, Wis., County court house, to Ceco Steel Products Co., Omaha.
 190 Tons, Urbana, Ill., residence hall for University of Illinois, to Concrete Steel Co., New York, through J. P. Cullen Co., Janesville, Wis.
 183 Tons, Darke and Miami Counties, Ohio, mesh for State project No. 187, to Bethlehem Steel, Bethlehem, Pa.
 175 Tons, Dayton, Ohio, addition to laboratory at Patterson Field, to Burger Iron Co., Dayton, Ohio.
 110 Tons, Detroit, General Motors Corp. diesel division factory, to Great Lakes Steel Corp., Detroit, through Taylor-Davis, Bryant & Detwiler, contractors.
 110 Tons, Carsonville, Mich., State highway bridge, to Bethlehem Steel Co., Bethlehem, Pa., through J. H. Baker, contractor.

WESTERN STATES

- 912 Tons, Burbank, Cal., Santa Monica distribution line for Metropolitan Water District (Spec. 33), to Columbia Steel Co., Los Angeles, for United Concrete Pipe Co.
 395 Tons, Los Angeles, Treasury Department project, to Truscon Steel Co., Youngstown.

- 242 Tons, Sepulveda Dam, Cal., bridges, to Truscon Steel Co., Youngstown, through Lovrich & Kanjevod.
 180 Tons, Fresno, Cal., city hall, to Kyle Steel Construction Co., Los Angeles.

CANAL ZONE

- 600 Tons, Panama Canal, schedule No. 4202, to Capital Steel Corp., New York.
 500 Tons, Albright Field, miscellaneous buildings, to Truscon Steel Co., Youngstown, through Robert E. McKee Co.

PENDING REINFORCING BAR PROJECTS

ATLANTIC STATES

- 1500 Tons, New London, Conn., submarine base improvements, F. H. McGraw Co., Hartford, Conn., contractor.
 1000 Tons, Brooklyn, Navy Yard submarine assembly shop; Walter Kidde, Inc., contractor.
 400 Tons, Willowbrook, N. Y., 10 patients buildings for State hospital; bids in.
 313 Tons, Brooklyn, Belt Parkway, contract E-3; bids Aug. 15.
 300 Tons, New York, Triborough Bridge Authority, contract C-3, bids Aug. 15.
 100 Tons, Ware, Mass., flood control wall.

CENTRAL STATES

- 700 Tons, St. Clair County, Ill., Cargill grain elevator.
 106 Tons, Lorain County, Ohio, mesh for State project No. 191, Ohio Engineering Co., Lorain, low bidder.

WESTERN STATES

- 7000 Tons, Bonneville, Ore., power plant substructure; bids Aug. 30 to United States Engineer, Portland, Ore.
 215 Tons, Zillah, Wash., Yakima Project (Invitation A-33965-A); bids Aug. 15.
 205 Tons, San Luis Obispo, Cal., State highway bridge, bids Aug. 28.
 183 Tons, Kettle Falls, Wash., State highway bridges; bids Aug. 20.
 175 Tons, Los Angeles, feeder mains, Metropolitan Water District (Specification 340); bids Aug. 14.
 125 Tons, Cheyenne, Wyo., State highway structure, bids Aug. 15.
 120 Tons, Mills, Wyo., Shoshone Reclamation project (Invitation B-22374-A).

Pipe Lines

Northern Natural Gas Co., Aquila Court, Omaha, Neb., plans extensions and replacements in steel pipe line system at Council Bluffs, Iowa, for natural gas distribution, including installation of control equipment and other facilities.

Bureau of Reclamation, Denver, asks bids until Aug. 27 for 4 to 20-in. outside diameter fabricated steel pipe for water distribution system at South Ogden, Utah, Ogden River project (Specifications 1409-D).

Magnolia Petroleum Co., Magnolia Building, Dallas, Tex., subsidiary of Socony-Vacuum Oil Co., New York, has awarded contract to Williams Brothers Corp., National Bank of Tulsa Building, Tulsa, Okla., for new 4½-in. welded steel pipe line from Fort Worth, Tex., where connection will be made with company oil refinery, to Oklahoma City, Okla., about 200 miles, for gasoline transmission. New bulk terminal will be built at last noted point.

Moss Point, Miss., plans pressure pipe line system for natural gas distribution, including welded steel pipe line for connection with supply source, control station and other operating facilities. Cost about \$80,000. Special election has been called Aug. 20 to vote bonds in that amount.

Bureau of Reclamation, Denver, asks bids Sept. 5 for steel pipe for Grand Coulee hydroelectric power plant, Grand Coulee, Wash., including fittings, valves, etc., Columbia Basin project (Specifications 1407-D).

General Purchasing Officer, Panama Canal, Washington, asks bids until Aug. 19 for six pieces of flexible steel piping for exhaust lines for diesel engine units (Schedule 4235).

Prices of Finished Iron and Steel...

Steel prices on these pages are f.o.b. basing points (in cents per lb.) unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, deductions, and in most cases freight absorbed to meet competition.

Basing Point ↓ Product													DELIVERED TO		
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio	Gulf Ports, Cars	Pacific Ports, Cars	Detroit	New York	Phila- delphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled ¹	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	
Long ternes ²	3.80¢		3.80¢									4.55¢			
Wrought iron	4.75¢														
STRIP															
Hot rolled ³	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢		
Cold rolled ⁴	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester =	3.00¢)				2.90¢		
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢								
Commodity C-R	2.95¢			2.95¢			2.95¢	(Worcester =	3.35¢)				3.05¢		
TIN PLATE															
Standard cokes (Per 100-lb. base box)	\$5.00	\$5.00	\$5.00						\$5.10						
BLACK PLATE															
29 gage ⁵	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢ (in)			
TERNES, M'FG															
Special coated (Per base box)	\$4.30		\$4.30						\$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel ⁶	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢					2.40¢	2.70¢			
Reinforcing (billet) ⁷	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢	2.25¢		
Reinforcing (rail) ⁷	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢	2.05¢				2.40¢	2.45¢	2.15¢		
Cold finished ⁸	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢							2.70¢		
PLATES															
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Coatesville and Claymont = 2.10¢)		2.45¢	2.65¢		2.29¢	2.15¢
Wrought iron	3.80¢														
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE⁹															
Bright	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Galvanized	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)								
Spring	3.20¢	3.20¢		3.20¢	3.20¢		(Worcester = 3.30¢)								
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢					2.85¢	2.95¢			
IRON BARS															
Common		2.25¢			(Terra Haute, Ind. = 2.15¢)										
Refined	3.75¢														
Wrought	4.40¢														

¹ Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. ² Unassorted 8-lb. coating. ³ Widths up to 12 in. ⁴ Carbon 0.25 per cent and less. ⁵ Applies to 29 gage within certain width and length limitations. ⁶ For merchant trade. ⁷ Straight lengths as quoted by distributors. ⁸ Also shafting. For quantities of 20,000 to 39,999 lb. ⁹ Carload lots to manufacturing trade. ¹⁰ Boxed.

PRICES

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are \$2 higher f.o.b. Duluth, billets only, \$2 higher.

Per Gross Ton
Rerolling\$34.00
Forging quality 40.00

Shell Steel

Basic open hearth shell steel f.o.b. Pittsburgh and Chicago.

Per Gross Ton
3 in. to 8 in.\$54.00
8 in. to 12 in. 52.00
12 in. to 18 in. 54.00
18 in. and over. 56.00

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting to length, or quantity. This type of steel is for hot rolled sections used for the making of shells and includes rounds, round squares, and special sections.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
Open hearth or bessemer\$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
Grooved, universal and sheared. 1.90c.

Wire Rods

(No. 5 to 9/32 in.) *Per Lb.*
Pittsburgh, Chicago, Cleveland 2.00c.
Worcester, Mass. 2.10c.
Birmingham 2.00c.
San Francisco 2.50c.
Galveston 2.25c.

9/32 in. to 47/64 in., \$3 a net ton higher. Quantity extras apply.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh; Package, 112 Sheets)
20x14 in. 20x28 in.

8-lb. coating I.C...	\$6.00	\$12.00
15-lb. coating I.C...	7.00	14.00
20-lb. coating I.C...	7.50	15.00
25-lb. coating I.C...	8.00	16.00
30-lb. coating I.C...	8.63	17.25
40-lb. coating I.C...	9.75	19.50

WIRE PRODUCTS

(To the Trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham)

Base per Keg
Standard wire nails\$2.55
Coated nails 2.55
Cut nails, carloads 3.85

Base per 100 Lb.
Annealed fence wire\$3.05

Base Column
Woven wire fence* 67
Fence posts (carloads) 69
Single loop bale ties 56
Galvanized barbed wire† 70
Twisted barbless wire 70

*15 1/2 gage and heavier. †On 80-rod spools in carload quantities.

Note: Birmingham base same on above items, except spring wire.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List
Machine and carriage bolts:
1/2 in. and 6 in. and smaller....68 1/2
Larger and longer up to 1 in....66
1 1/8 in. and larger.....64
Lag bolts66

Plow bolts, Nos. 1, 2, 3, and 7....68 1/2
Hot pressed nuts; c.p.c., t-nuts;
square, hex., blank or tapped:
1/2 in. and smaller.....67
9/16 in. to 1 in. inclusive.....64
1 1/8 in. to 1 1/2 in. inclusive.....62
1 5/8 in. and larger.....60

On above items, excepting plow bolts, additional allowance of 10 per cent for full container quantities.

On all of the above items there is an additional 5 per cent allowance for car-load shipments.

Semi-fin. hexagon nuts U.S.S.	S.A.E.
1/2 in. and smaller.....	67 70
9/16 to 1 in.....	64 65
1 1/8 in. through 1 1/2 in..	62 62
1 5/8 in. and larger.....	60 60

In full container lots, 10 per cent additional discount.

Stove bolts, packages, nuts loose

75 and 10

Stove bolts in packages, with nuts

attached75

Stove bolts in bulk.....83 1/2

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York, lots of 200 lb. or over.

Large Rivets

(1/2 in. and larger)

Base per 100 Lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham\$3.40

Small Rivets

(7/16 in. and smaller)

Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham65 and 10

Cap and Set Screws

Per Cent Off List

Milled hexagon head, cap screws,
1 in. dia. and smaller....50 and 10

Milled headless set screws, cut
thread 1/4 in. and larger.... 64

3/16 in. and smaller..... 73

Upset hex. head cap screws U.S.S.
or S.A.E. thread 1 in. and
smaller 70

Upset set screws, cup and oval
points 75

Milled studs 52

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Aug. 7	Aug. 8	Aug. 9	Aug. 10	Aug. 12	Aug. 13
Copper, Electrolytic ¹	11.00	11.00	11.00	11.00	11.00	11.00
Copper Lake	11.00	11.00	11.00	11.00	11.00	11.00
Tin, Straits, New York.....	52.125	51.875	51.75	....	51.75	51.375
Zinc, East St. Louis ²	6.25	6.25	6.25	6.25	6.25	6.25
Lead, St. Louis ³	4.70	4.70	4.60	4.60	4.60	4.60

¹ Mine producers' quotations only, delivered Conn. Valley. Deduct 1/4 c. for approximate New York delivery price. ² Add 0.39c. for New York delivery. ³ Add 0.15c. for New York delivery.

Warehouse Products

Cents per lb., Delivered

	New York	Cleveland
Tin		
Straits pig	52.75	....
Copper		
Electro	12.25	12.125
Castings	12.50	11.875
H. R. sheets*.....	19.62	19.62
Seamless tubes*	20.12	20.12
Brass		
Yellow, sheets*	18.23	18.23
Yellow, rods*	13.26	13.26
Seamless tubes*	20.98	20.98
Zinc		
Slabs	7.60	7.75
Sheets, No. 9 casks..	12.00	12.00
Lead		
American pig	5.85	5.25
Bar	7.80	8.00
Cut sheets	8.00	8.60

Antimony
Asiatic
 16.00 | 17.00 |

Aluminum
Virgin, 99%
 20.00 | 21.00 |

No. 1 remelt., 98-99% 18.00 18.50

Solder
1/2 and 1/2
 31.750 | 32.50 |

Babbitt
Anti-friction grade..
 22.00 | 22.00 |

Old Metals

Cents per lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their use.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper		
Hvy. crucible	8.625	9.25
Hvy. and wire ...	7.535	8.00
Light and bottoms	6.625	7.125
Brass		
Heavy	4.750	5.255
Light	3.750	4.50
No. 1 yel. turn...	4.50	5.50
No. 1 red or compo.		
turnings	7.125	7.625
Hvy. Mach. compo.	7.375	8.00
Lead		
Heavy	3.875	4.250
Aluminum		
Cast	8.00	9.00
Sheet	13.00	14.00
Zinc	3.25	4.00

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered: virgin, 99 per cent plus, 18c.-19c. a lb.; No. 12 remelt No. 2 standard, 18c.-19c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt: Asiatic, 16.50c. a lb., New York; American, 13c. a lb., f.o.b. smelter. QUICK-SILVER, \$188-\$190 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 11.75c. a lb.

*These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/4; on brass sheets and rods, 40; on brass tubes, 33 1/4, and copper tubes, 40.

PRICES

ALLOY STEEL

Alloy Steel Blooms, Billets and Slabs

Base per gross ton, f.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo or Bethlehem.....\$54.00

Alloy Steel Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade 2.70c.
Delivered, Detroit 2.80c.

S.A.E. Series Numbers	Alloy Differential, per 100 Lb.
2000 (1.5 Ni)	\$0.35

2100 (1.5 Ni)	0.75
2300 (3.5 Ni)	1.55
2500 (5 Ni)	2.25
3100 Ni-Cr	0.70
3200 Ni-Cr	1.35
3300 Ni-Cr	3.80
3400 Ni-Cr	3.20
4100 Cr-Mo (0.15 to 0.25 Mo.)..	0.55
4100 Cr-Mo (0.25 to 0.40 Mo.)..	0.75
x4340 Cr-Ni-Mo	1.65
4340 Cr-Ni-Mo	1.85
4600 Ni-Mo (0.2-0.3 Mo, 1.5-2 Ni)	1.10
5100 (0.60-0.90 Cr)	0.35
5100 (0.80-1.10 Cr)	0.45
5100 Cr spring steel	0.15
52-100 Cr. (electric furnace)....	2.60
6100 Cr-V bar	1.20

6100 Cr-V spring steel	0.85
Cr-Ni-V	1.50
C-V	0.85

The above differentials are for hot rolled finished products. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

Base per pound, f.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.35c. Delivered Detroit, 3.45c., carlots.

STAINLESS AND HEAT-RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chromium-Nickel

No.	304	302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium

No.	410	430	442	446
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
H't strip	17.00c.	17.50c.	24.00c.	35.00c.
C'd st.	22.00c.	22.50c.	32.00c.	52.00c.

TOOL STEEL

(F.o.b. Pittsburgh)

	Base per Lb.
High speed .....	.67c.
High-carbon-chromium .....	.43c.
Oil-hardening .....	.24c.
Special .....	.22c.
Extra .....	.18c.
Regular .....	.14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

ELECTRICAL SHEETS

(F.o.b. Pittsburgh)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

Silicon strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

CAST IRON WATER PIPE

Per Net Ton

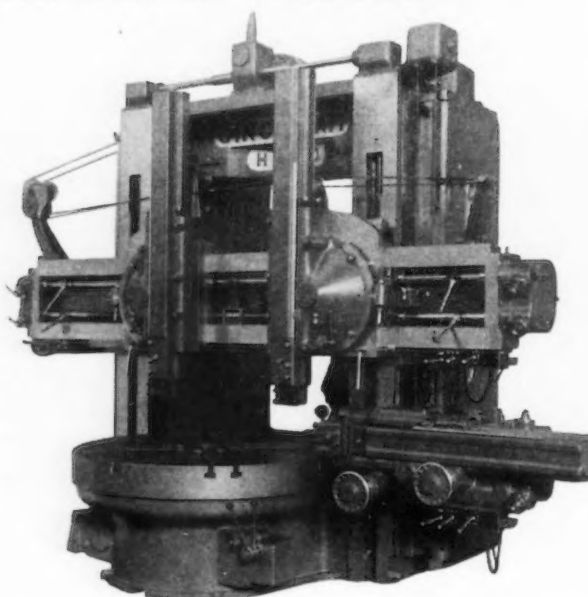
6-in. and larger, del'd Chicago..	\$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham..	46.00
6-in. and larger f.o.b. dock, San Francisco or Los Angeles or Seattle	56.00

Class "A" and gas pipe, \$3 extra; 4-in. pipe is \$3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$45 at Birmingham and \$53.80 delivered Chicago.

Cincinnati

SPIRAL BEVEL GEARED

HYPRO VERTICAL BORING MILLS



Engineered to combine speed, flexibility and ease of control with power, rigidity and accuracy to meet the requirements of today.

Designed for:

1. Centralized Pendant Station Control which provides operation of the entire machine from the operator's position.
2. Individual feed and rapid traverse boxes with independent Rapid Traverse Motors for each head, making it possible to control each head independent of the other.
3. Automatic lubrication provided to all feed boxes, table drive, heads and saddles requiring no attention on the part of the operator.

In these competitive times, you need this kind of equipment. Full particulars sent upon written request.

Sizes—54", 64", 72", 84", 100", 120", 144".

PLANERS • PLANER MILLERS • BORING MILLS

THE CINCINNATI PLANER CO.

CINCINNATI, OHIO

PRICES

BOILER TUBES

Seamless Steel and Lap Weld Commercial
Boiler Tubes and Locomotive Tubes.
Minimum Wall.

(Net base prices per 100 ft., f.o.b. Pitts-
burgh, in carload lots)

	Seamless Cold Drawn	Hot Rolled	Lap Weld, Hot Rolled
1 in. o.d. 13 B.W.G.	\$9.01	\$7.82	....
1 1/4 in. o.d. 13 B.W.G.	10.67	9.26	....
1 1/2 in. o.d. 13 B.W.G.	11.70	10.23	\$9.72
1 3/4 in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/4 in. o.d. 13 B.W.G.	16.76	14.54	13.79
2 1/2 in. o.d. 12 B.W.G.	18.45	16.01	15.16
2 3/4 in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	21.42	18.59	17.54
3 1/2 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3 3/4 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4 1/2 in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in. o.d. 9 B.W.G.	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over.....	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.....	65%

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District
and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought iron
pipe)

Base Price=\$200 Per Net Ton

Butt Weld

Steel	Black	Galv.
1/8 in.	56	36
1/4 to 3/8 in.....	59	43 1/2
1/2 in.	63 1/2	54
3/4 in.	66 1/2	58
1 to 3 in.....	68 1/2	60 1/2

Wrought Iron

	Black	Galv.
1/4 and 3/8 in.....	+9	+30
1/2 in.	24	6 1/2
3/4 in.	30	13
1 and 1 1/4 in.....	34	19
1 1/2 in.	38	21 1/2
2 in.	37 1/2	21

Lap Weld

Steel		
2 in.	61	52 1/2
2 1/2 and 3 in.....	64	55 1/2
3 1/2 to 6 in.....	66	57 1/4
7 and 8 in.....	65	55 1/2
9 and 10 in.....	64 1/2	55
11 and 12 in.....	63 1/2	54

Wrought Iron

2 in.	30 1/2	15
2 1/2 to 3 1/2 in.....	31 1/2	17 1/2
4 in.	33 1/2	21
4 1/2 to 8 in.....	32 1/2	20
9 to 12 in.....	28 1/2	15

Butt weld, extra strong, plain ends

Steel	Black	Galv.
1/8 in.	54 1/2	41 1/2
1/4 to 3/8 in.....	56 1/2	45 1/2
1/2 in.	61 1/2	53 1/2
3/4 in.	65 1/2	57 1/2
1 to 3 in.....	67	60

Wrought Iron

1/4 and 3/8 in.....	+10	+43
1/2 in.	25	9
3/4 in.	31	15
1 to 2 in.....	38	22 1/2

Lap weld, extra strong, plain ends

Steel		
2 in.	59	51 1/2
2 1/2 and 3 in.....	63	55 1/2
3 1/2 to 6 in.....	66 1/2	59

	Black	Galv.
7 and 8 in.....	65 1/2	56
9 and 10 in.....	64 1/2	55
11 and 12 in.....	63 1/2	54

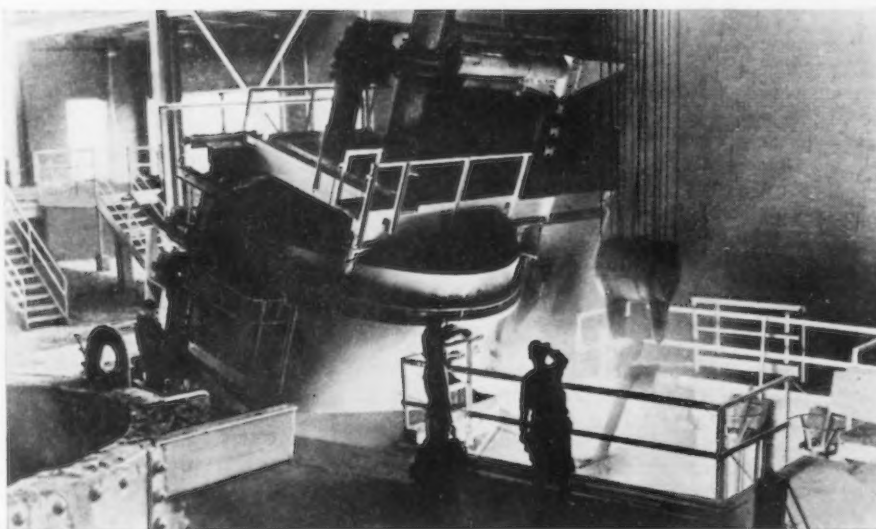
Wrought Iron

2 in.	33 1/2	18 1/2
2 1/2 to 4 in.....	39	25 1/2
4 1/2 to 6 in.....	37 1/2	24
7 and 8 in.....	38 1/2	24 1/2
9 to 12 in.....	32	20 1/2

On butt weld and lap weld steel pipe
jobbers are granted a discount of 5%. On
less-than-carload shipments prices are de-
termined by adding 25 and 30% and the
carload freight rate to the base card.

F.o.b. Gary prices are two points lower
discount or \$4 a ton higher than Pitts-
burgh or Lorain on lap weld and one
point lower discount, or \$2 a ton higher,
on all butt weld 8 in. and smaller.

AN EXAMPLE



OF A MODERN INSTALLATION OF HIGH CAPACITY

SWINDELL

ELECTRIC ARC MELTING FURNACES

THE PHOTOGRAPH SHOWS ONE OF A PAIR OF 16'-0" SWINDELL SWINGING-PROOF
ELECTRIC ARC MELTING FURNACES, EACH OF 35-TON CAPACITY, AT THE
COPPERWELD STEEL CO., WARREN, OHIO.

SWINDELL SWINGING ROOF FURNACES

PRODUCE HIGH-GRADE STEEL
AT LOWEST COST

SWINDELL-DRESSLER CORPORATION
PITTSBURGH, PA.

PRICES

ORES

Lake Superior Ores

Delivered Lower Lake Ports

	<i>Per Gross Ton</i>
Old range, bessemer, 51.50% ..	\$4.75
Old range, non-bessemer, 51.50% ..	4.60
Mesaba, bessemer, 51.50%	4.60
Mesaba, non-bessemer, 51.50% ..	4.45
High phosphorus, 51.50%	4.35

Foreign Ores*

C.A.F. Philadelphia or Baltimore, Exclusive of Duty

	<i>Per Unit</i>
Algerian, low P, Cu free, dry, 55 to 58% Fe.....	12c.

Caucasian, washed, 52% Mn.....	60c.
African, Indian, 44 to 48% Mn...	50c.
African, Indian, 49 to 51% Mn...	55c.
Brazilian, 46 to 48% Mn.....	53c.
Cuban, del'd, duty free, 51% Mn.	72c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered.....	\$23.50
Tungsten, domestic scheelite, delivered	23.50
Chrome ore, lump c.i.f. Atlantic Seaboard, per gross ton:	
South African (low grade)...	Nom.
Rhodesian, 45%	\$23.50
Rhodesian, 48%	27.50

RAILS, TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., gross ton	\$40.00
Angle bars, 100 lb.....	2.70

F.o.b. Basing Points

Light rails (from billets), gross ton	\$40.00
Light rails (from rail steel), gross ton	39.00

Base per Lb.

Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast.....	2.30c.
Track bolts, steam railroads...	4.15c.
Track bolts, discount to jobbers all sizes (per 100 counts)...	65-5

Basing points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minneaqua, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond, Va.

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail.....	\$20.00 to \$21.00
Domestic, f.o.b. Ohio River landing barges	\$20.00 to \$21.00
No. 2 lump, 85-5 f.o.b. Kentucky and Illinois mines..	\$20.50 to 21.00
Foreign, 85% calcium fluoride, not over 5% Si., c.i.f. Atlantic ports, duty paid....	\$25.00 to \$25.50
Domestic No. 1 ground bulk, 96 to 98%, calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines....	\$31.00
As above, in bags, f.o.b. same mines	\$32.60

REFRACTORIES

Fire Clay Brick

Per 1000 f.o.b. Works

Super-duty brick, at St. Louis..	\$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey.....	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois.....	42.75
Second quality, New Jersey....	49.00
No. 1 Ohio	39.90
Ground fire clay, per ton.....	7.10

Silica Brick

Pennsylvania	\$47.50
Chicago District	55.10
Birmingham	47.50
Silica cement, net ton (Eastern)	8.55

Chrome Brick

Net per Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester...	\$50.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	50.00

Magnesite Brick

Standard f.o.b. Baltimore and Chester	\$72.00
Chemically bonded, f.o.b. Baltimore	61.00

Grain Magnesite

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)....	(—)*
Domestic, f.o.b. Baltimore and Chester in sacks	\$40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

*None available.

WHO IS THE "BOSS" the MAN, or the MACHINE?

● In thousands of industrial plants certain machines stubbornly refuse to do things except in their own way—at their own pace.

They have one set speed, and they stick to it—through thick and thin!

Alongside these machines are others, equipped with REEVES Variable Speed Control. They respond to every demand for change of pace to meet changing conditions and materials, to process or manufacture different sizes and shapes of products, to match the operator's skill, to keep "in step" with other machines in the production line. The operator merely turns the REEVES hand-wheel to get any speed he needs—even to a fraction of a revolution—and that exact speed is maintained as long as he desires.

There is no question which of these machines is the more profitable. REEVES Variable Speed Control makes any production machine a better investment. Why not let the REEVES representative in your territory look over the machines

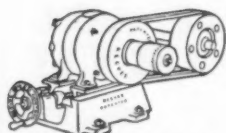


in your plant, and make recommendations? No obligation. Write us today. REEVES PULLEY COMPANY, Dept. I-80, Columbus, Indiana.

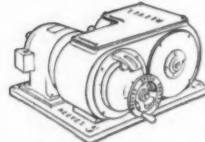
World's Largest Line—Built Around 3 BASIC UNITS



VARIABLE SPEED TRANSMISSION for infinite speed control over wide range—2:1 to 16:1 inclusive—and for heavy duty service. Fractional to 78 h.p. capacities.



VARI-SPEED MOTOR PULLEY for direct application to shaft extension of any standard motor and for ratios of speed variation not exceeding 3:1 range.



MOTODRIVE which combines motor, variable speed drive and gear reducer in a single compact unit. Fractional to 10 h.p. capacities; speed range 2:1 through 6:1.

**Visit Our Exhibit at the Iron & Steel Exposition
Stevens Hotel, Chicago, Sept. 24-27, Booth No. 220**

REEVES SPEED CONTROL

PRICES

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload).....\$120.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....\$36.00

Domestic, 26 to 28%..... 49.50

Electric Ferrosilicon

Per Gross Ton, Delivered, Lump Size

50% (carload lots, bulk).....\$74.50*

50% (ton lots, packed)..... 87.00*

75% (carload lots, bulk).....135.00*

75% (ton lots, packed).....151.00*

Bessemer Ferrosilicon

Per Gross Ton, F.o.b. Jackson, Ohio

10.00 to 10.50%.....\$33.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, \$1 per ton additional.

Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton, F.o.b. Jackson, Ohio

5.00 to 5.50%.....\$27.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon.....11.00c.

2% carbon17.50c.

1% carbon18.50c.

0.10% carbon20.50c.

0.06% carbon21.00c.

Spot prices are ¼c. per lb. of contained chromium higher.

Silico-Manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon\$113.00*

2.50% carbon 118.00*

2% carbon 123.00*

1% carbon 133.00*

Other Ferroalloys

Ferrotungsten, per lb. contained W, del. carload..... \$2.00

Ferrotungsten, 100 lb. and less 2.25

Ferrovanadium, contract, per lb. contained V., del'd \$2.70 to \$2.90†

Ferracolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., ton lots \$2.25†

Ferrocobalt, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace, carload and contract, per net ton.....\$142.50

*Spot prices are \$5 per ton higher.

†Spot prices are 10c. per lb. of contained element higher.

Ferrocobalt, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton.....\$157.50

Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with \$3 unitage, freight equalized with Rockdale, Tenn., per gross ton \$58.50

Ferrophosphorus, electrolytic 23-26% in carlots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, \$3 unitage, freight equalized with Nashville \$75.00

Ferromolybdenum, per lb. Mo, f.o.b. furnace..... 95c.
Calcium molybdate, per lb. Mo, f.o.b. furnace 80c.
Molybdenum oxide briquettes 48-52% Mo, per lb. contained Mo, f.o.b. Langeloth, Pa. 80c.

FUEL OIL

Per Gal.

No. 3, f.o.b. Bayonne, N. J.....4.75c.

No. 6, f.o.b. Bayonne, N. J.....3.21c.

No. 5 Bur. Stds., del'd Chicago..3.25c.

No. 6 Bur. Stds., del'd Chicago..2.75c.

No. 3 distillate, del'd Cleveland.5.25c.

No. 4 industrial, del'd Cleveland.5.00c.

No. 5 industrial, del'd Cleveland.3.75c.

No. 6 industrial, del'd Cleveland.3.25c.



PARISH STAMPINGS *Travel Light*

CARLINE BRACKET — Used for connection between side posts and roof carlines in body frame construction of present type trailers.

Buses, trailers, railroad cars, and all transportation units, earn dividends through light weight construction. This is made possible by using high

strength, corrosion resistance stampings.

To witness:—These brackets made by Parish are of .050" Ga. and 3/16" High Tensile Steel. They bring sturdy endurance, increased pay-load capacity to trailers.

Parish engineers can bring an added value to your product. Let us show you how.



PARISH PRESSED STEEL CO.

READING, PENNA.

Pacific Coast Representative
F. Somers Peterson Co.,
57 California St.,
San Francisco, California



SPRING BRACKET — For trailer, made of several pressed steel plates welded to form the assembly shown. Lighter and Stronger.

PRICES

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, prompt	\$4.50 to \$4.75
Foundry, f.o.b. Connellsville, prompt	\$5.25 to 5.50
F'dry, by-product, Chicago....	10.50
F'dry, by-product, New England	12.50
Foundry, by-product, Newark or Jersey City	\$11.30 to \$11.90
F'dry, by-product, Philadelphia	11.13
F'dry, by-product, Cleveland...	11.05
F'dry, by-product, Cincinnati..	10.50
Foundry, Birmingham	7.50
F'dry, by-product, St. Louis	\$10.75 to \$11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports.....	\$14.75

BRITISH

British

Per Gross Ton, f.o.b. United Kingdom Ports

Ferromanganese, export.	£17 18s.
Tin plate, per base box 32s. to 33s.	
Steel bars, open hearth	£13 9s.
Beams, open hearth....	£12 2s. 6d.
Channels, open hearth..	£12 2s. 6d.
Angles, open hearth....	£12 2s. 6d.
Black sheets, No. 24 gage	£18 17s. 6d. max.*; £18 17s. 6d. min.**
Galvanized sheets, No. 24 gage	£19 10s. max.*; £19 10s. min.**

*Empire markets only.

**Other than Empire markets.

PIG IRON (Per Gross Ton)

Prices delivered various consuming points indicated by bold italics

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phos.
Boston	\$24.50	\$24.00	\$25.50	\$25.00	.....
Brooklyn	26.50	.....	.....	27.00	.....
Jersey City	25.53	25.03	26.53	26.03	.....
Philadelphia	24.84	24.34	25.84	25.34	.....
Bethlehem, Pa.	\$24.00	\$23.50	\$25.00	\$24.50	.....
Everett, Mass.	24.00	23.50	25.00	24.50	.....
Swedeland, Pa.	24.00	23.50	25.00	24.50	.....
Steelton, Pa. ....	.....	23.50	.....	.....	28.50
Birdsboro, Pa.	24.00	23.50	25.00	24.50	28.50
Sparrows Point, Md.	24.00	23.50	.....	.....	.....
Erie, Pa.	23.00	22.50	24.00	23.50	.....
Neville Island, Pa.	23.00	22.50	23.50	23.00	.....
Sharpsville, Pa.	23.00	22.50	23.50	23.00	.....
Buffalo	23.00	22.00	24.00	23.50	28.50
Cincinnati	23.44	23.61	.....	24.11	.....
Canton, Ohio	24.39	23.89	24.89	24.39	.....
Mansfield, Ohio	24.94	24.44	25.44	24.94	.....
St. Louis	23.50	23.02	.....	.....	.....
Chicago	23.00	22.50	23.50	23.00	.....
Granite City, Ill.	23.00	22.50	23.50	23.00	.....
Cleveland	23.00	22.50	23.50	23.00	.....
Hamilton, Ohio	23.00	22.50	23.50	23.00	.....
Toledo	23.00	22.50	23.50	23.00	.....
Youngstown	23.00	22.50	23.50	23.00	.....
Detroit	23.00	22.50	23.50	23.00	.....
St. Paul	25.63	.....	26.13	25.63	.....
Duluth	23.50	.....	24.00	23.50	.....
Birmingham	19.38*	18.00	24.00	.....	.....
Los Angeles, San Francisco and Seattle....	27.50	.....	.....	.....	.....
Provo, Utah	22.00	.....	.....	.....	.....
Montreal†	27.50	27.50	.....	28.00	.....
Toronto†	25.50	25.50	.....	26.00	.....

GRAY FORGE

Valley or Pittsburgh fee.....\$22.50

CHARCOAL

Lake Superior fee.....\$27.00
Delivered Chicago 30.34

Base prices are subject to an additional charge for delivery within the switching limits of the respective districts.

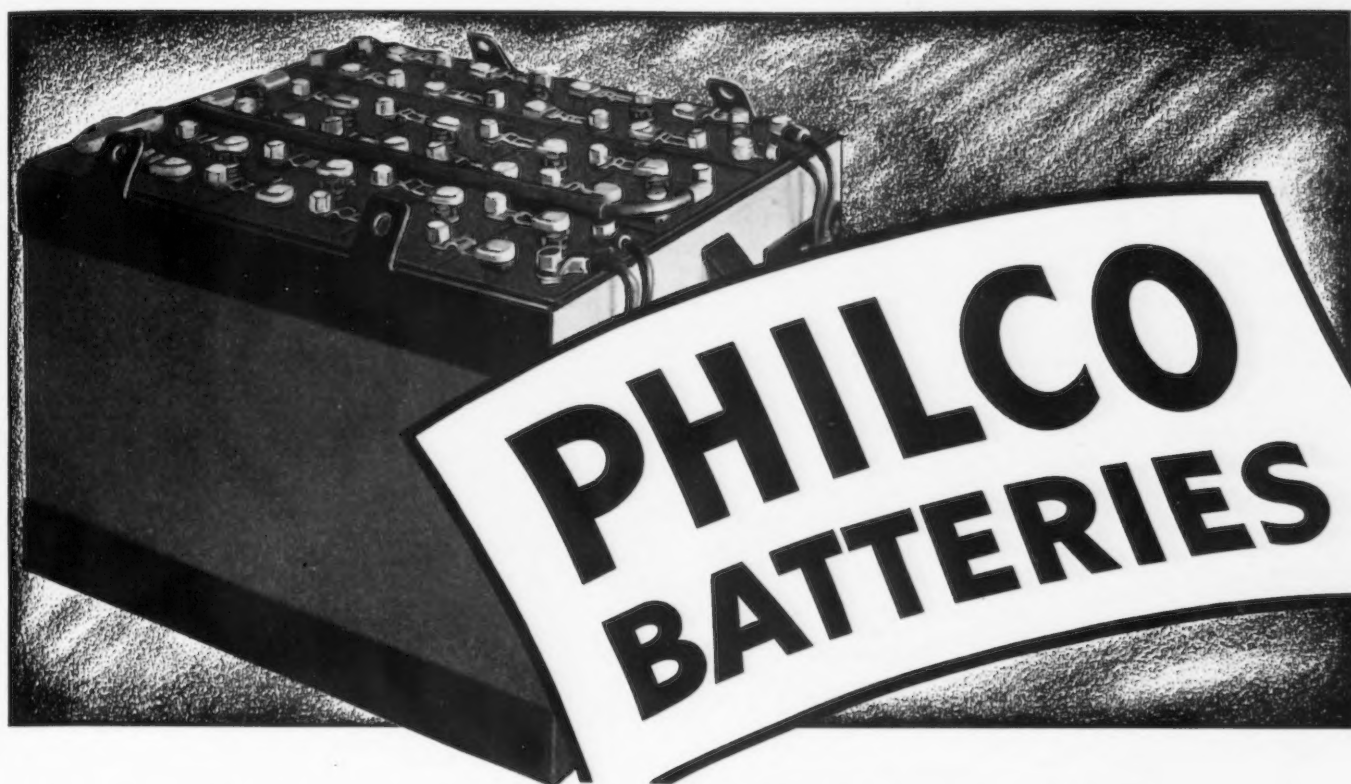
*Delivered prices on Southern iron for shipment to Northern points are 38c. a ton below delivered prices from nearest Northern basing point on iron with phosphorus content of 0.70 per cent and over. †On all grades 2.25 per cent silicon and under is base. For each 25 points of silicon over 2.25 per cent an extra of 25c. is charged.

WAREHOUSE PRICES

(Base Prices, Dollars per 100 lb., Delivered Metropolitan Areas)

	Pitts- burgh	Chicago	Cleve- land	Phila- delphia	New York	Detroit	Buffalo	Boston	Birm- ingham	St. Louis	St. Paul	Mil- waukee	Los Angeles
Sheets, hot rolled	\$3.15	\$3.05	\$3.15	\$3.35	\$3.38	\$3.23	\$3.05	\$3.51	\$3.45	\$3.18	\$3.30	\$3.48	\$4.30
Sheets, cold rolled .....	.....	4.10	4.05	4.05	4.40	4.30	4.30	4.58	.....	4.12	4.35	4.43	6.50
Sheets, galvanized	4.75	4.60	4.42	4.75	4.30	4.64	4.00	4.66	4.75	4.95	4.75	4.98	5.25
Strip, hot rolled	3.40	3.40	3.30	3.75	3.76	3.48*	3.62	3.86	3.70	3.52	3.65	3.73	.....
Strip, cold rolled	3.20	3.30	3.20	3.31	3.31	3.20	3.22	3.26	.....	3.41	3.83	3.54	.....
Plates	3.40	3.55	3.40	3.55	3.76	3.60	3.62	3.85	3.35	3.47	3.80	3.68	4.00
Structural shapes	3.40	3.55	3.58	3.55	3.75	3.65	3.40	3.85	3.55	3.47	3.80	3.68	4.00
Bars, hot rolled	3.35	3.50	3.25	3.85	3.84	3.43	3.35	3.98	3.50	3.62	3.75	3.63	4.15
Bars, cold finished	3.65	3.75	3.75	4.06	4.09	3.80	3.75	4.13	4.43	4.02	4.34	3.88	6.60
Bars, ht. rld. SAE 2300.	7.20	7.10	7.30	7.31	7.35	7.42	7.10	7.50	.....	7.47	7.45	7.33	9.40
Bars, ht. rld. SAE 3100.	5.75	5.65	5.85	5.86	5.90	5.97	5.65	6.05	.....	6.02	6.00	5.88	8.55
Bars, cd. drn. SAE 2300.	8.15	8.15	8.15	8.56	8.59	8.45	8.15	8.63	.....	8.52	8.84	8.38	10.65
Bars, cd. drn. SAE 3100.	6.75	6.75	6.75	7.16	7.19	7.05	6.75	7.23	.....	7.12	7.44	6.98	9.80

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over. Exceptions: Chicago, galvanized sheets, 500 to 1499 lb.; Philadelphia, galvanized sheets, one to nine bundles, cold rolled sheets, 1000 to 1999 lb.; Detroit, galvanized sheets, 500 to 1499 lb.; Buffalo, cold rolled sheets, 500 to 1500 lb., galvanized sheets, 450 to 1499 lb.; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; Birmingham, hot rolled sheets, strip and bars, plates and shapes, 400 to 3999 lb., galvanized sheets, 500 to 1499 lb.; St. Louis, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 500 to 1499 lb.; Milwaukee, cold rolled sheets, 400 to 1499 lb., galvanized sheets, 150 to 499 lb.; New York, hot rolled sheets, 0 to 1999 lb., cold rolled sheets, 400 to 1499 lb.; St. Paul, galvanized and cold rolled sheets, any quantity, hot rolled bars, plates, shapes, hot rolled sheets, 400 to 14,999 lb.; Los Angeles, hot rolled sheets, bars, plates, shapes, cold rolled sheets, 300 to 1999 lb., galvanized sheets, 150 to 1049 lb. Extras for size, quality, etc., apply on above quotations. *12 gage and heavier, \$3.23.



The Only Triple-Insulated Batteries that give you

**CHECK THESE
PHILCO FEATURES**

- ✓ **EXTRA CAPACITY**—
10% more in the same
compartment space
- ✓ **CONSTANT SPEED**
—uniform throughout the
entire working day
- ✓ **LOWER COST**—reduced
material handling cost per
truck unit
- ✓ **LONG, USEFUL LIFE**
—with lower charging and
maintenance cost.
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—insuring dependable,
trouble-free performance
- ✓ **RUGGED CONSTRUCTION**—handles tough
jobs in your electric truck
operation, day in and day
out.

*Only Philco has
all these features!*

**10% EXTRA
CAPACITY**

in the Same Compartment Space!

Power to spare for the toughest job! Imagine . . . 10% EXTRA CAPACITY in the compartment space of your present trucks or new electric trucks. Ample capacity to do an entire day's work under peak conditions.

Try these powerful Philco Batteries for economy and efficiency . . . they'll do your material handling job the way you want it done. Philco is the only Triple-Insulated Battery with 10% EXTRA CAPACITY. Check your requirements with Philco Engineers. They can help you. Write:

PHILCO, Battery Division
Dept. 353
Philadelphia, Pa.

Sales Possibilities

... CONSTRUCTION, PLANT EXPANSION AND EQUIPMENT BUYING

North Atlantic

• **Charles Pfizer & Co., Inc.**, 81 Maiden Lane, New York, industrial and other chemicals, has let general contract to W. J. Barney Corp., 101 Park Avenue, for new four-story and basement storage and distributing building, 100 x 225 ft., at Flushing and Tompkins Avenues, Brooklyn, to be used in conjunction with local plant at 11 Bartlett Street. Cost close to \$275,000.

Vulcan Rail & Construction Co., Maspeth, L. I., architectural and ornamental iron products, has let general contract to Ryan Contracting Co., 341 East Seventy-ninth Street, New York, for extensions and improvements in two-story plant, 100 x 300 ft. Cost about \$45,000. Koch & Wagner, 32 Court Street, Brooklyn, are architects.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Aug. 21 for quantity of test indicators, test oscillators, dry battery sets, etc. (Circular 41); until Aug. 23 for 1400 test sets (Circular 51).

Ericsson Screw Machine Products Co., Inc., 25 Lafayette Street, Brooklyn, plans new one-story plant at Boston Post Road and Richards Avenue, Norwalk, Conn. Cost close to \$75,000.

George Ehret Brewery, Inc., 193 Melrose Street, Brooklyn, plans one-story addition to be equipped as a mechanical-bottling unit; also will modernize and improve present rack house and adjoining structure. Cost over \$75,000. Shampman & Shampman, 26 Court Street, are architects.

State Department of Education, State Education Building, Albany, N. Y., plans new aviation school, including shops and other structures, 200-ft. steel hangar and other facilities for aviation instruction. Cost close to \$1,000,000. W. E. Haugaard, State Office Building, is commissioner of architecture.

Public Works Officer, Navy Yard, Brooklyn, has secured appropriation of \$600,000 for new shops and other buildings, and modernization and improvements in certain existing buildings, and will begin work soon.

Fisher Body Division, General Motors Corp., Tarrytown, N. Y., has approved plans for expansion and improvements in local plant, including installation of new conveyor system and other facilities. Cost over \$150,000.

Rheem Mfg. Co., 30 Rockefeller Plaza, New York, steel barrels, drums, etc., has let general contract to Brown & Matthews, Inc., 122 East Forty-second Street, for new one-story plant on 25-acre tract of land at Sparrows Point, Baltimore, recently acquired. An office building also will be erected. Cost over \$85,000.

Curtiss-Wright Propeller Division, Clifton, N. J., airplane propellers, a unit of Curtiss-Wright Corp., 30 Rockefeller Plaza, New York, has let general contract to John W. Ryan Co., 369 Lexington Avenue, for new one-story plant, 225 x 600 ft., at Caldwell, N. J., with one-story power house, 45 x 80 ft., and administration building, 50 x 250 ft. Cost over \$500,000. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Public Service Electric & Gas Co., Terminal Building, Newark, will begin work at once on new power substation on Roseland Avenue, Caldwell, and make transmission line extensions in that area, to cost about \$200,000 with equipment.

Specialty Screw Machine Products Co., 336 South West End Avenue, Lancaster, Pa., has let general contract to Klump Co., East King Street, for two-story plant unit, 50 x 125 ft. Cost over \$60,000.

Public Works Officer, Building No. 1, Navy Yard, Philadelphia, has appropriation of \$600,000 for new shops and other buildings, including improvements in certain present structures at Fort Mifflin, Mustin Field and naval aircraft factory.

Rohm & Haas Co., 222 West Washington Square, Philadelphia, industrial chemicals, has asked bids on general contract for eight-story addition, 55 x 75 ft. Cost over \$125,000. Tilden & Pepper, Lewis Tower Building, are architects.

New England

• **Florence Stove Co.**, Gardner, Mass., oil and gas stoves, parts, etc., has let general contract to Columbus & Berg Co., Gardner, for one-story addition for engineering department. Cost close to \$40,000 with equipment. Company also has begun work on two-story and basement extension, for which general contract recently was let to Donald D. Snyder, Inc., 36 Comee Street, for storage and distribution. Cost over \$50,000 with equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Sept. 9 for quantity of gages, fixtures and patterns; punches and dies; one set of machine units and other processing equipment; 60 to 300 gun barrel assemblies, cal. .50 for aircraft service; and 20 to 100 similar heavy-type gun barrel assemblies, with like quantity of similar barrel assemblies, water-cooled (Circular 46).

Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, Conn., airplane engines and parts, has let general contract to Turner Construction Co., 420 Lexington Avenue, New York, for two one-story additions, to be equipped as engine test houses. Cost close to \$90,000 with equipment. This is part of expansion now under way at plant; entire project to cost about \$8,000,000. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Buffalo District

• **Dow & Co., Inc.**, Court and Wilkeson Streets, Buffalo, road and highway equipment, plans one-story addition, 100 x 160 ft., for storage and distribution. Cost over \$50,000.

Harrison Radiator Corp., Division of General Motors Corp., Lockport, N. Y., automobile radiators, has let general contract to John W. Cowper Co., Inc., Sidway Building, Buffalo, for one-story addition, 240 x 350 ft., with two-story section. Structure will be equipped for copper processing, storage, distribution and other service. Cost about \$175,000 with equipment.

Washington District

• **Newport News Shipbuilding & Dry Dock Co.**, Newport News, Va., has asked bids on general contract for new shipyard and shops, designed for construction of aircraft carriers for Federal Government. Cost close to \$1,000,000.

Public Works Officer, Fifth Naval District, Naval Operating Base, Norfolk, Va., has let

general contract to O. T. Graham & Co., Mutual Building, Richmond, Va., for one-story torpedo shop and storage building at naval mine depot, Yorktown, Va., at \$68,700 exclusive of equipment.

Construction Quartermaster, Edgewood Arsenal, Edgewood, Md., plans new ordnance assembly plant, magazines and auxiliary structures, with improvement in certain present buildings. Fund of \$918,968 has been authorized for buildings and equipment. This is in addition to recently announced appropriations for ammunition processing and loading plant, warehouses, shops, etc., totaling \$1,571,758.

Delmarva Power Co., Vienna, Md., has asked bids on general contract for addition to steam-electric generating station. Cost reported over \$1,000,000. Utility Management Corp., 61 Broadway, New York, is consulting engineer.

Bureau of Yards and Docks, Navy Department, plans new ammunition depot and naval torpedo station at yard at Bellevue, D. C. Fund of \$400,000 has been authorized for work.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 20 for five single-spot electric welding machines (Schedule 2602), quantity of steel bolts and nuts, and lag bolts (Schedule 2528), quantity of oil and grease cups (Schedule 2580), one motor-driven, heavy-duty internal grinder (Schedule 2590), quantity of rivets, washers and burrs (Schedule 2566), one electric arc-welding set and spare parts (Schedule 2604) for Eastern and Western navy yards; until Aug. 23 for quantity of steel flasks (Schedule 2639) for Portsmouth, N. H., and Mare Island, Cal., navy yards.

South Atlantic

• **South Carolina Public Service Authority**, Charleston, S. C., asks bids until Sept. 6 for construction of Pinopolis hydroelectric power plant, about 32 miles from Charleston, Santee-Cooper River project, including main station, elevator house, lock house, utilities building and auxiliary structures; also for furnishing and installing all general mechanical equipment for power plant, such as oil and water pumps, air compressors, oil purifiers, piping, valves, etc. Harza Engineering Co., 27 Cumberland Street, Charleston, is consulting engineer.

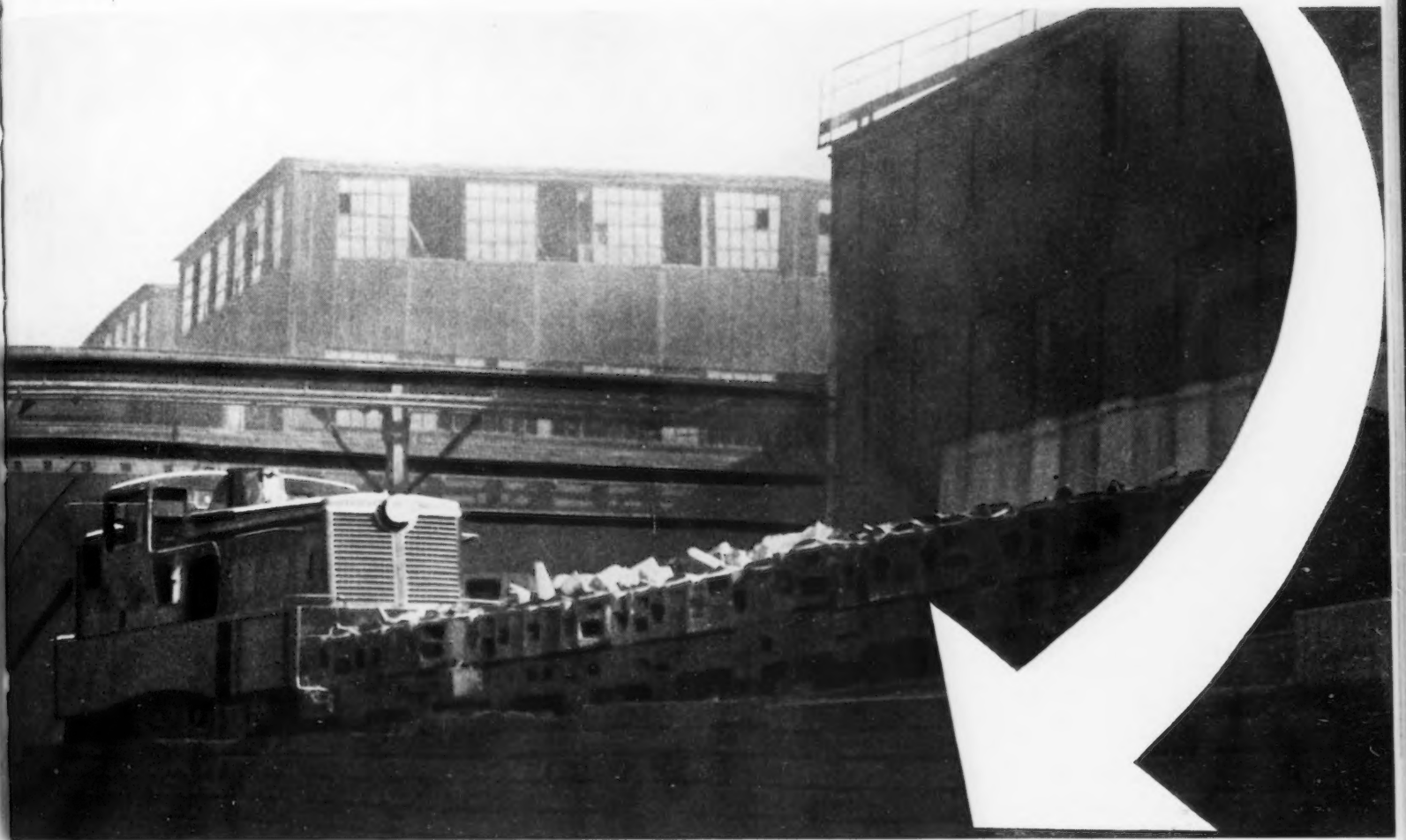
Seaboard Airline Railway, Norfolk, Va., has let general contract to Halsema Brothers, Inc., 1629 N. E. First Avenue, Miami, Fla., for new one-story shop 50 x 160 ft., at yards at Miami, to be equipped for diesel engine repairs and maintenance. Cost over \$65,000. W. D. Faucette, chief engineer, is in charge.

South Central

• **Lloyd E. Jones Co.**, Central Avenue, Chattanooga, Tenn., fabricated steel products, plans new one-story plant, 180 x 200 ft., with office structure adjoining, on Manufacturers Road, North Chattanooga. A 20-ton traveling crane, hoists, conveyors and other mechanical-handling equipment will be installed. Cost over \$90,000.

Tennessee Valley Authority, Knoxville, Tenn., plans new steam-electric generating plant in vicinity of Watts Bar Hydroelectric generating station, now in course of erection, and will select site at once. It will be equipped for initial capacity of 120,000-kw., supplementing hydroelectric power plants of Authority. Completion is scheduled early in

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1942. This is part of expansion program to cost \$25,000,000, for which appropriation recently was authorized by Congress. Charles T. Main, Inc., 201 Devonshire Street, Boston, is consulting engineer for steam-electric station.

Reynolds Metals Co., Inc., 810 East Franklin Street, Richmond, Va., metal products, tin and aluminum foils, etc., is considering sites at Birmingham, Sheffield, Ala., and vicinity, for new plant for production of aluminum, for which loan of \$15,800,000 was arranged recently through RFC. Plant will consist of several large processing units, machine and mechanical shops, and auxiliary structures. Machinery will be electric-operated, with power supply to be secured from TVA transmission system in territory noted. New mill is scheduled for completion early in 1941.

Southwest

• **State Building Commission**, Bi-Partisan Advisory Board, State House, Jefferson City, Mo., Edgar M. Eagan, acting secretary, asks bids until Aug. 26 for extensions and improvements in power house at institution at Mount Vernon, Mo., including new boiler unit and accessories, stoker, boiler room instruments, piping, etc. E. L. Williams, State House, is architect and engineer.

Coca-Cola Bottling Co., 2930 North Market Street, St. Louis, has let general contract to Gamble Construction Co., 620 Chestnut Street, for new one-story mechanical-bottling, storage and distributing plant, 100 x 125 ft., at Garrison Avenue and Benton Street. Cost about \$60,000. Preston J. Bradshaw, Inc., 718 Locust Street, is architect.

George S. Gano Grain Co., Wiley Building, Hutchinson, Kan., has let contract to J. T. McDowell Construction Co., Denver, Colo., for series of 16 new tanks, each 24 ft. diameter and 100 ft. high, at mill. Cost close to \$100,000.

Shell Oil Co., Inc., 100 Bush Street, San Francisco, has acquired property at Houston, Tex., as site for new branch plant for production of toluene from petroleum. It will comprise several one and multi-story units, with power house, pumping station, machine shop and miscellaneous mechanical structures. Cost about \$500,000.

Lone Star Gasoline Co., 1915 Wood Street, Dallas, Tex., plans new gas recycling plant, comprising several processing units, with compressor station, steel storage tanks, pumping plant, loading racks and other facilities. Cost close to \$350,000.

Western Pa. District

• **Westinghouse Electric & Mfg. Co.**, East Pittsburgh, has engaged Robert & Co., Bona Allen Building, Atlanta, Ga., architects and engineers, to prepare plans for new factory branch, storage and distributing plant on Forrest Avenue, near Barnett Street, N. E., Atlanta, comprising several one-story structures with office building. Cost over \$500,000.

Ohio and Indiana

• **Electric Products Co.**, 1725 Clarkstone Road, Cleveland, electrical equipment, has let general contract to Bolton-Pratt Co., Marion Building, for one-story addition, 40 x 140 ft. Cost over \$65,000. H. M. Morse Co., 1500 Superior Avenue, is architect and engineer.

Haughton Elevator Co., 671 Spencer Street, Toledo, Ohio, freight and other elevators, parts, etc., has approved plans for one-story addition, including new office structure. Cost close to \$140,000. Mills, Rhines, Bellman & Nordhoff, Inc., 518 Jefferson Avenue, is architect.

John Deere Plow Co., 130 East Naghten Street, Columbus, Ohio, agricultural imple-

ments and equipment, plans one-story addition. Cost close to \$60,000.

City Council, Paulding, Ohio, plans early call for bids for electric generating unit and auxiliary equipment for municipal power and waterworks station.

Farrell-Cheek Steel Co., Sandusky, Ohio, steel castings, etc., has let general contract to Carl Werner, Sandusky, for two one-story additions, 70 x 100 ft., and 40 x 175 ft., to be used as a machine shop, and general service respectively. Cost close to \$75,000.

Dubois Soap Co., 1120 West Front Street, Cincinnati, soaps, washing powders, etc., has let general contract to Ferro Concrete Construction Co., Third and Elm Streets, for one-story addition for storage and distribution. Cost close to \$40,000. F. G. Gross, 215 Race Street, is consulting engineer.

Paoli Tomato Products Co., Paoli, Ind., canner and packer, plans rebuilding of portion of main plant recently destroyed by fire. Loss was close to \$100,000.

Sunbeam Electric Mfg. Co., Read Street and Morgan Avenue, Evansville, Ind., automobile headlights, etc., has let general contract to Tri-State Contracting Co., 1525 Shanklin Avenue, for one-story addition to power house at plant. Cost about \$45,000. Bevington-Williams, Inc., Indiana Pythian Building, Indianapolis, is consulting engineer.

Michigan District

• **Wells Mfg. Corp.**, Three Rivers, Mich., electric saws for butcher and other service, band saws, etc., has let general contract to M. C. J. Billingham, Kalamazoo, Mich., for one-story addition, 60 x 210 ft. Cost over \$85,000.

Romulus Grey Iron Foundry Co., Romulus, Mich., grey iron castings, etc., plans rebuilding of portion of plant recently destroyed by fire. Loss over \$75,000.

Monsanto Chemical Co., 1700 South Second Street, St. Louis, industrial and other chemical products, has acquired tract of about 175 acres of land at Trenton, Mich. Plant will consist of group of one and multi-story units, equipped for production of sodium phosphate and allied chemicals, with machine shop, pumping station, power station and other mechanical structures. Cost reported over \$700,000.

Frederick Colman & Sons, Inc., 7250 Central Avenue, Detroit, tools, dies, special machinery, etc., plans one-story addition. Cost close to \$140,000. Austin Co., 14112 Euclid Avenue, Cleveland, is engineer and contractor.

Middle West

• **Midwest Forging & Mfg. Co.**, 38 South Dearborn Street, Chicago, structural steel tubing, fence posts, etc., has asked bids on general contract for one-story addition to plant on Sixteenth Street, Chicago Heights. Cost reported close to \$50,000.

Joyce 7-Up Co., Inc., 12 Webster Avenue, Joliet, Ill., has let general contract to Hansen & Peterson Co., 204 South Des Plaines Street, for new one and two-story and basement mechanical-bottling, storage and distributing plant, 170 x 235 ft., on Plainfield Road. Cost close to \$225,000.

Racine Airport, Inc., Racine, Wis., recently organized by Mr. Godske, A. J. Horlick and associates, plans new airport at East River Road and Rapids Drive, including steel hangars, machine shops, administration building, oil and gasoline storage tanks and other facilities. Cost over \$500,000.

City Council, Rush City, Minn., will take bids at once for new municipal power plant, including diesel engine-generator units and auxiliary equipment. Also for electrical distribution lines and facilities. Cost about \$200,000. Ralph D. Thomas & Associates, 1200 Second Avenue South, Minneapolis, Minn., are consulting engineers.

Chicago Flexible Shaft Co., 5600 West Roosevelt Road, Chicago, flexible shafts, electric household appliances and kindred products, has asked bids on general contract for two-story and basement addition, 70 x 100 ft. Cost over \$65,000. Olson & Urbain, 228 North LaSalle Street, are architects.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until Aug. 26 for quantity of binding post assemblies, junction boxes, switchboards, panels and other equipment (Circular 42).

John Deere Tractor Co., Miles Street, Waterloo, Iowa, farm tractors and parts, has let general contract to John G. Miller Construction Co., 222 West Mullan Avenue, for seven-story and basement addition, 120 x 200 ft., for general production, storage and distribution. Cost about \$300,000.

Pacific Coast

• **Associated Telephone Co.**, 1314 Seventh Street, Santa Monica, Cal., has let general contract to Alco Construction Co., 5423 Flemish Village Lane, Los Angeles, for group of eight one-story mechanical shops, storage and distributing buildings. Cost close to \$100,000. W. Horace Austin, 532 Chestnut Avenue, Long Beach, Cal., is architect.

Marchant Calculating Machine Co., Powell and Landregan Streets, Oakland, Cal., calculating and other office machines, parts, etc., has approved plans for expansion, including installation of new machinery for parts production and assembling divisions. Cost reported over \$50,000.

Douglas Aircraft Corp., 3000 Ocean Park Boulevard, Santa Monica, Cal., airplanes and parts, plans one-story addition to plant on Imperial Highway, El Segundo, totaling 112,800 sq. ft. floor space, for expansion in parts production and assembling departments. A traveling crane, hoists, conveyors and other mechanical-handling equipment will be installed. Cost over \$500,000. Edward C. and Ellis W. Taylor, 803 West Third Street, Los Angeles, are architects and engineers.

Seattle-Tacoma Shipbuilding Corp., Tacoma, Wash., has let general contract to General Construction Co., Tacoma, for one-story addition at shipyard on Alexander Street, for equipment storage and distribution. Cost close to \$45,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Aug. 20 for medium-pressure air compressors, spare parts, tools and wrenches (Schedule 2589), 80 stockless steel anchors (Schedule 2593) for Puget Sound Navy Yard, Bremerton, Wash.; two gasoline engine-driven tractors (Schedule 2581) for Seattle; until Aug. 23 for one motor-driven wet and dry knife grinder (Schedule 2638) for Mare Island, Cal.; Navy Yard; one semi-trailer (Schedule 2629) for San Diego, Cal.; Naval Air Station.

Canada

• **Canadian Westinghouse Co., Ltd.**, Sanford Avenue North, Hamilton, Ont., subsidiary of Westinghouse Electric & Mfg. Co., East Pittsburgh, has asked bids on general contract for one-story addition, 65 x 450 ft. Cost over \$250,000. D. P. Brown, address noted, is company engineer. Hutton & Souter, Piggott Building, are architects.

John Inglis Co., Ltd., 14 Strachan Avenue, Toronto, Ont., boilers, tanks and other plate products, will begin superstructure soon for one-story addition, about 150 x 1100 ft., extending over two city blocks, to be equipped for production of Bren guns and allied munitions. Cost about \$400,000.

Moffats, Ltd., Dennison Road, Weston, Ont., gas and electric ranges, refrigerators, etc., plans one-story addition. Cost close to \$70,000. Prack & Prack, Piggott Building, Hamilton, Ont., are architects and engineers.